THE IRON TRADE REVIEW

Registered U. S. Patent Office

Published Weekly
VOL. LXIX. No. 5

CLEVELAND, AUGUST 4, 1921

Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

Six Dollars a Year
Single Copy 25 Cents

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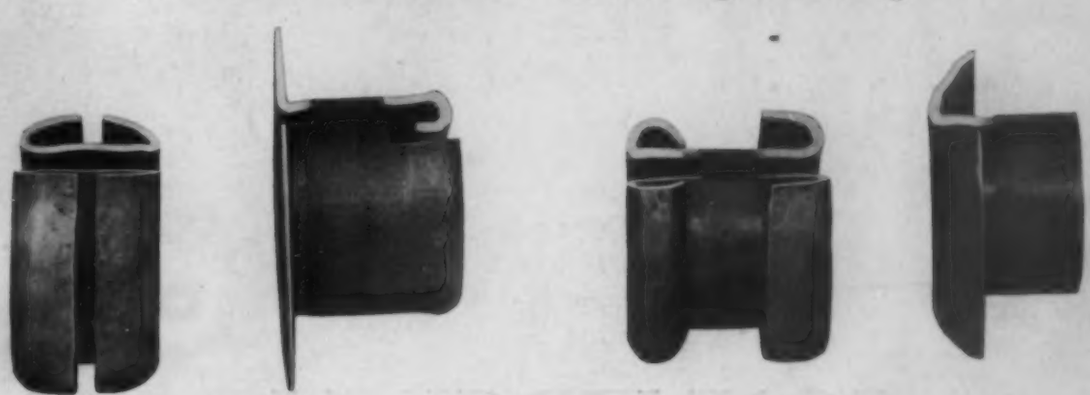

Some idea of the quality of Harrisburg Skelp may be obtained from the illustrations above, which are two inch and three inch welded boiler tubes, formed cold without cracking.

This quality is typical of all Harrisburg products, whether they be raw steel in billets, slabs, skelp or hot rolled strips, semi-finished materials such as hollow forgings, or finished products such as Harrisburg Drawn Seamless Steel Cylinders for High Pressure Gases or Harrisburg Forged Seamless Steel Couplings.

Every kind of steel made by Harrisburg in its basic open-hearth furnaces is really a specialty job developed to meet the utmost requirements of the product for which the steel is made. For many years Harrisburg has set high standards of steel manufacture.

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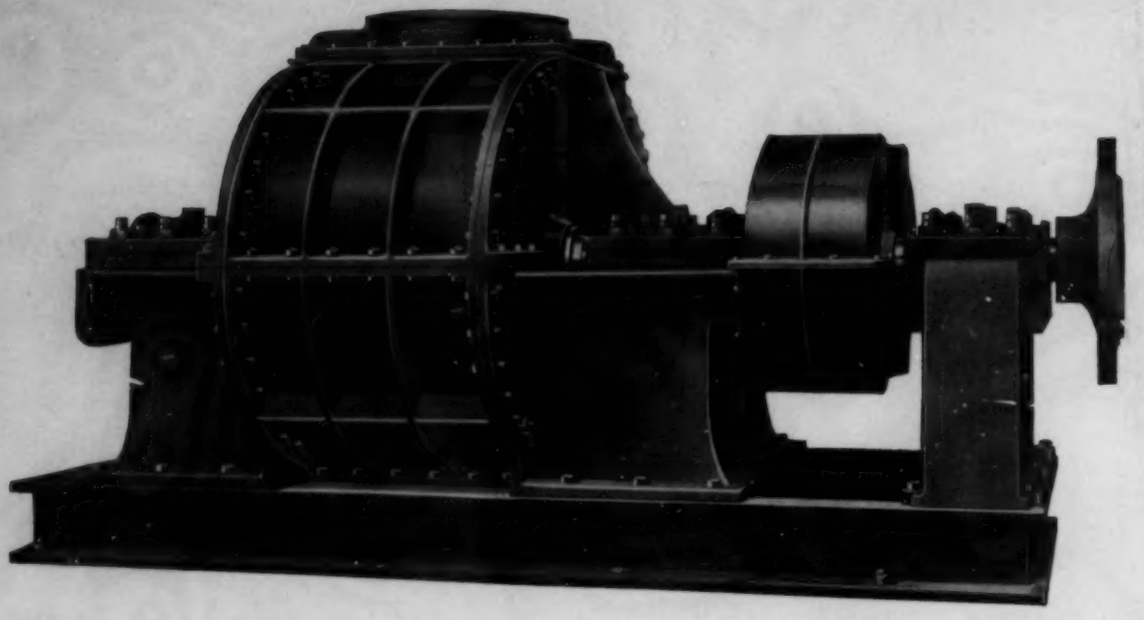

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MODERN because produced by an organization which has given nearly thirty years to the study, design and construction of rotary positive blowers and pumps and originated the High Pressure Rotary Positive Blower.

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Vol. LXIX

THE IRON TRADE REVIEW

Registered U. S. Patent Office

No. 5

Cleveland, August 4, 1921

Market Tonnage Grows Slowly

Miscellaneous Buying Shows Increase as Consumers' Stocks Are Reduced—Mill Operations Improve in Spots—Railroads Place 8,000 Car Repairs—July Pig Iron Production at Lowest Mark on Modern Records

NEW tonnage in iron and steel is growing in a modest way. Orders are more numerous but their smallness individually still reflects the general caution of buyers. Confidence in the stabilization of prices apparently is yet to be won before sizable activity can be stimulated. The encouraging aspects of the situation are the increasing evidence of reduced stocks in consumers' hands and some expansion of current needs which are forcing the former into the market. The best buying continues in wire products and in tubular goods. Sheet demand has picked up considerably the past two weeks. Mahoning Valley sheet production this week is at 52 per cent of capacity the best record since December. A spotty improvement in other mill lines is shown.

Prices have been less irregular this week but remain unsettled in certain lines despite the manifest effort of various independent mills to more consistently maintain the last reductions. Plates have continued to show softness with sales this week at 1.75c and 1.80c Pittsburgh. Structural shapes also are not firm. Steel bars, however, are better held. Some mystery surrounds the exact price at which the 7000 tons of plain material was placed by a Mt. Vernon, O., fabricator but 1.60c to 1.65c is accepted. This business is understood to have gone to two large western Pennsylvania producers. Sheets show a spread of $5 under the last reduced level. Low prices have been made in sheet bars and slabs particularly in northern Ohio and in the Chicago district.

Low Record Output

Pig iron production in July dropped to the lowest point recorded since monthly compilations of output were inaugurated by THE IRON TRADE REVIEW 15 years ago. For the first time on record, July production was 864,580 tons which compared with June shows a loss of 199,427 tons made up of 18 per cent among the merchant furnaces and 72 per cent among the steelworks stacks. Compared with a year ago, pig iron production now is on about a 28 per cent basis and with the high mark of 1916, at about 26 per cent. The number of furnaces blowing at the end of July was 69, a loss of 4 from the corresponding date one month previously.

Car Repairs Placed

Car repair awards this week show up well, the total being about 8000 including 2500 for the New York Central, 1500 for the Pittsburgh & Lake Erie, 1500 for the Lackawanna, 1000 for the Big Four and the remainder scattering. The Pennsylvania is expected to bring forward a large program of repairs this month. The New York Central system took bids this week on a large variety of track materials totaling 3500 to 4000 tons. Other roads have been buying track fastenings in an increased amount.

The wage reduction movement still is under way. The Cambria Steel Co. has announced its third cut this year, amounting to 16 2/3 per cent and effective Aug. 16 which will place common labor at 25 cents per hour. The H. C. Frick Coke Co., Steel corporation subsidiary, posted a second reduction of 10 per cent applying Aug. 1 which restores the late 1917 level.

A smaller change is shown in the weekly composite market average of THE IRON TRADE REVIEW which this week is $36.56. Last week it was $36.69, and two weeks ago $37.55. The all July average was $38.14 compared with $68.69 in July, 1920, and $26.34 in July, 1913.

More Iron Shipped

Signs in pig iron are little more encouraging. Bookings by eastern Pennsylvania furnaces in July total 25,000 to 30,000 tons. Shipments are rising though slowly and August starts off better than any month since May. At Chicago the movement of iron from the furnaces is exceeding production and stocks are being drawn upon. Prices are steadier. A 2000-ton sale of basic was made at $18 valley. Jackson county producers have reduced silveries $8 and bessemer ferrosilicon $8.50 per ton.

THE IRON TRADE REVIEW

Registered U. S. Patent Office

Devoted to the Iron, Steel, Foundry and Metalworking Industries

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND

Member, Audit Bureau of Circulation and Associated Business Papers, Inc.

BRANCH OFFICES

BOSTON - - - - - - - - - - - - - - 426 Old South Bldg.
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FOREIGN OFFICES

BIRMINGHAM, ENG. - - - - - - - - - Prince's Chambers
LONDON, ENG. - - 2-3 Caxton House, Westminster, S. W. 1.

Cable Address, PROTRAPEN, London

Subscription, United States, Cuba and Mexico, $6 per year. Canada $8.50 and other Foreign Countries, $11 per year.

Entered at the Postoffice at Cleveland as Second Class Matter
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Steel Curtailment Is Phenomenal

JUDGMENTS and comparisons in iron and steel as well as in any other fundamental industry constantly are being drawn against a so-called normal condition of business activity. However there seems to be no clearly defined standard as to what constitutes a normal period. Obviously with the growth of the country and of the industry, the normal level is subject to constant change. Customarily a year is said to be a normal one when capacity is fully employed and profits are satisfactory. Thus 1913 has come to be looked upon as a standard of prewar years against which all facts of the war period and subsequently may be compared.

Actually 1913 is proved by mathematical formula to have been substantially a normal year. In a remarkably interesting and exact study of production trends in iron and steel appearing with various charts on page 297 in this issue, it is indicated that 1913 production of steel was 100 per cent of normal basis as plotted, and of pig iron, 104 per cent of normal. The formula employed in this calculation is that accepted by leading economists as the most reliable means of ascertaining the future trend of a fluctuating curve. It no doubt will prove surprising to many that the production line in 1920 also stands practically at the theoretical normal level or at 100 per cent in steel ingots and castings and 97 per cent in pig iron. Other years in which the production of iron and steel were close to the normal line, were 1910 and 1912.

The 100 per cent years according to the theoretical standard, indeed, have been few. The abnormally high or low years have been the most numerous. In the war period of 1916 to 1919, the production mark was well above the indicated normal line for these respective years. The year 1917 is shown to have been the most out of line as to excess production in steel, of any year in modern history with an output of 121 per cent. In pig iron 1917 shows 112 per cent which, however, was exceeded by 1916 with 118 per cent, by 1905 with 113 per cent, by 1906 with 117 per cent, and by 1907 with 113 per cent. The years 1905, 1906 and 1907 also were well above the normal scale in steel.

Reversing the picture, the chart tells a story more applicable and impressive under present business conditions. The year 1914 to which the minds of buyers and sellers are turning for present day comparisons, was practically three-quarters normal or 76 per cent in pig iron and 75 per cent in steel. Prior to that, the depression year of 1908 gages up 67 per cent in pig iron and 60 per cent in steel.

These figures help in the measuring and interpreting of the present curtailment of the industry. Under the given rule, the rate of pig iron production in June was down to 33 per cent of the absolute normal and of steel, to 34 per cent. The June rate is typical of the 1921 year to date. These comparisons demonstrate several things. They serve to prove how phenomenally depressed is the current rate of production in iron and steel. In fact, per capita output is back to the level of 25 years ago as shown by a separate chart accompanying the article. Furthermore the normal line of production for the country is constantly rising. On the basis of reason or the average experience of years, the present situation is an impossible one and cannot long endure. The iron and steel industry has reached the position where an early recovery is inevitable. The first tangible signs of this already are appearing.

Develop Foreign Tool Market

PERHAPS no branch of industry has felt the business depression more than the machine tool and equipment trade. Invariably it is the first to feel the effects of a slack business season and the last to benefit in an era of industrial prosperity. When business started to fall off last year it was immediately reflected in the cancellation of orders for tools. At the

present time tools on dealers' floors frequently represent liabilities instead of assets.

In many cases tool builders have resorted to price cutting in an effort to revive trade; in fact, present prices are estimated to be no more than 60 per cent above those of 1914. However, these reductions have not resulted in an increase in demand. Apparently nothing can be done to immediately revive trade in the machine tool field until general business starts an upward trend.

A number of observers believe that the salvation of the tool industry lies in diverting part of the idle plant capacity to other lines of work and in developing the export market for machine tools. A few builders may be able to turn to the manufacture of commodities other than machine tools, but in the main this is out of the question in view of the enormous cost involved. Most large producers realize this and are confining their efforts to improvements in the designs of tools.

Not a few tool manufacturers look to the export field as an outlet for their products. At present the only real obstacle to such trading is the unfavorable exchange situation, but despite this, American manufacturers should not lose sight of the fact that now is the time to lay the foundation for future business abroad. Effective campaigns now will pave the way for good trading later on when favorable exchange rates permit European buyers to talk business.

Preparing for the Future

ALTHOUGH 1921 is expected to reward fighters, it is evident that at midnight next Dec. 31, hundreds of fighters still will be awaiting their reward. Admirable as was the western newspaper's prophetic slogan as an incentive, it has fallen far short of covering the business situation. Surely it does not apply to the manufacturer who finds the demand for his product has fallen to 10 per cent of normal and will remain there until some outside influence, beyond the control of the industry itself, acts to revive buying. In many cases of this kind, manufacturers will do better to cease "fighting" and employ their energies toward putting their houses in order for the time when a good battle will be better rewarded.

That a surprisingly large number of producers in the iron and steel industry are pursuing this policy is indicated by the amount of engineering work in progress. With pig iron production at its lowest ebb, furnace operators, particularly the smaller companies, are relining stacks, substituting skips and mechanical stock distributors for the hand-operated equipment, and improving the ore handling and storing apparatus. Remodeling of rolling mills, although not as general as the blast furnace reconstruction work, is receiving attention in a number of plants.

The tendency to prepare for the future is even more noticeable in the foundry industry, where the business depression has been felt keenly. In a number of cases engineers have been called in to completely revamp the layout of equipment in order to be able to produce castings economically when the demand returns.

Many new concerns will be ready to share in the flow of business. There probably are a hundred or more machine shops, foundries, metal working plants, small mills, etc., built during the past year, which will offer strong competition to established manufacturers when conditions improve.

Therefore, it will be seen that while 1921 will reward those who could fight, there are a great number of manufacturers, who, unable or not preferring to do so, have been conserving their energy for future conflicts. To them, 1922 will bring rewards for their vision, courage and faith in the soundness of the foundation of business.

Pittsburgh Base and Competition

REPORTS recently appearing in the daily press and also in some of those specialized publications which are supposed to be more conversant with the history of the iron and steel market, to the effect that Pittsburgh base on steel products is being or is about to be abandoned, have a very familiar ring. If the self-same publications were consulted in 1914, 1908, and at various other past periods of depressed business conditions and intensified competition, practically similar articles would be found there contained. In fact, a business slump if severe enough, is pretty sure to bring forth the prediction or advice to the country that the days of Pittsburgh plus are numbered. Still the old system has gone on through the years and each reviving state of business has found it in full effect.

Irrespective of the fact that the equity of the Pittsburgh basing system is under judicial question by reason of the complaint by various consumer groups before the federal trade commission, the present situation is no different from that which has existed at various times in the past. Under the present condition of keen competition, various mills have been quoting away the advantage of their location, by naming prices at Chicago, valley on local works, and giving the consumer part or all of the Pittsburgh freight. It would be a mistake for consumers to attach to this too much importance as a permanent development. It would be much wiser in the light of experience to regard this condition as a temporary one created by an exceedingly lean market where every producer is intent upon securing for himself the best portion possible of a limited offering tonnage. The situation actually is an economic one which is dictated by the laws of supply and demand. It tends to support the point of view that the Pittsburgh basing system is not an instrument of rigid price fixing but actually is responsive to the ebb and flow of the market.

Iron and Steel Prices

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Seven Years Ago

August 3, 1921	July 27, 1921	July, 1921	May, 1921	August, 1920	August, 1914
$36.56	$36.69	$38.14	$43.32	$68.87	$22.72

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

SCRAP PRICES, PAGE 328; WAREHOUSE, ORE, CAST IRON PIPE, FERROALLOYS AND OTHER PRICES, PAGE 324

Pig Iron

Bessemer, valley	$20.00
Bessemer, Pittsburgh	21.96
Basic, valley	18.00
Basic, Pittsburgh	19.96
Basic, Buffalo	19.00 to 20.00
Basic delivered, eastern Pa.	21.50
Malleable, valley	20.00
Malleable, Pittsburgh	21.96
Malleable, Chicago	18.50 to 19.00
Malleable, Buffalo, furnace	20.00 to 21.00
Malleable, del., eastern Pa.	24.00 to 25.00

FOUNDRY IRON SILICONS

No. 2 Northern	**1.75 to 2.25**
No. 2 Southern foundry	**1.75 to 2.25**
No. 2X East'n and Virginia	**2.25 to 2.75**
No. 1X Eastern	**2.75 and up**
No. 1 Chicago	**2.25 to 2.75**
No. 2 foundry Eastern	**1.75 to 2.25**

No. IX, eastern del. Phila.	$23.35 to 24.00
No. IX, Buffalo	22.50 to 23.00
No. 2 foundry, valley	19.00 to 20.00
No. 2 foundry, Pittsburgh	20.96 to 21.96
No. 2 foundry, Buffalo	19.50 to 21.00
No. 2 foundry, Chicago	18.00 to 19.00
No. 2 foundry Ironton furnace	**20.00 to 21.00**
No. 2 foundry, Cleveland	21.00 to 21.50
No. 2X, eastern del. Phila.	20.35 to 21.75
No. 2X, eastern N. J., tidewater	20.80 to 22.50
No. 2X, eastern del. Boston	**25.06 to 27.06**
No. 2X foundry, Buffalo fur.	21.25 to 22.25
No. 2X, Buffalo del. Boston	**25.46 to 26.46**
No. 2 foundry del. Philadelphia	20.35 to 21.50
No. 2 foundry, N. J., tidewater	20.80 to 22.00
No. 2 southern, Birmingham	19.00 to 20.00
No. 2 southern, Cincinnati	23.50 to 25.50
No. 2 southern, Chicago	25.66 to 26.66
No. 2 southern, Philadelphia	27.66 to 28.66
No. 2 southern, Cleveland	25.66 to 26.66
No. 2 southern, Boston	26.65 to 27.65
No. 2 southern, St. Louis	24.72 to 25.72
No. 2X, Virginia furnace	24.00 to 25.00
No. 2X, Virginia Philadelphia	29.74 to 30.74
No. 2X, Virginia Jersey City	30.29 to 31.29
No. 2X, Virginia Boston	**30.58 to 31.83**
Gray forge, eastern Pa.	21.25 to 22.75
Gray forge, val., del., Pitts.	19.46
Low phos., standard, valley	36.00 to 37.00
Low phos., standard, Phila.	**43.32**
Low phos., Lebanon furnace	**35.00**
Charcoal, Superior, Chicago	35.50 to 37.50
Charcoal, Birmingham	**35.00**

Silvery Iron
8 per cent base

Jackson county, O., furnace	27.50
Tennessee, Chicago delivery	32.82
Ohio brands, Chicago	32.82

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$36.50
11 per cent	39.80
12 per cent	43.10
13 per cent	47.10
14 per cent	52.10

Coke

Beehive, Ovens

Connellsville furnace	**$3.75 to 3.00**
Connellsville foundry	3.75 to 4.00
Pocahontas furnace	**8.00 to 8.50**
Pocahontas foundry	**8.50 to 9.50**
New River furnace	**6.50 to 7.50**
New River foundry	**8.00 to 9.00**
Wise county furnace	**5.25 to 5.75**
Wise county foundry	**6.00 to 7.00**
Alabama furnace	4.50 to 5.00
Alabama foundry	5.50 to 6.00

By-Product

Foundry, Newark, N. J., del.	$8.84
Foundry, Chicago, ovens	11.25

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$30.00
Open-hearth, Youngstown	30.00
Open-hearth, Philadelphia	35.74
Bessemer, Pittsburgh	30.00
Bessemer, Youngstown	30.00
Forging, Philadelphia	40.74
Forging, Pittsburgh	35.00

SHEET BARS

Open-hearth, Pittsburgh	$30.00 to 32.00
Open-hearth, Youngstown	30.00 to 32.00
Bessemer, Pittsburgh	30.00 to 32.00
Bessemer, Youngstown	30.00 to 32.00

SLABS

Pittsburgh and Youngstown	$30.00 to 31.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$42.00
Grooved skelp, Pittsburgh	1.85c
Universal skelp, Pittsburgh	1.85c
Sheared skelp, Pittsburgh	1.85c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	1.70c to 1.85c
Structural shapes, Philadelphia	2.05c to 2.20c
Structural shapes New York	2.08c to 2.23c
Structural shapes, Chicago	2.18c
Tank plates, Pittsburgh	1.75c to 1.85c
Tank plates, Philadelphia	2.10c to 2.25c
Tank plates, New York	2.13c to 2.28c
Tank plates, Chicago	2.18c
Bars, soft steel, Pittsburgh	1.75c
Bars, soft steel, Philadelphia	2.10c
Bars, soft steel, New York	2.13c
Bars, soft steel, Chicago	2.13c
Bars, hard steel, Chicago	1.85c to 1.90c
Bar iron, common, del. Pitts.	2.10c to 2.13c
Bar iron, common, Philadelphia	2.10c
Bar iron, common, New York	2.13c
Bar iron, common, Chicago	1.75c to 1.85c

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Hoops, Bands, Shafting

Hoops, Pittsburgh	2.40c to 2.50c
Bands, Pittsburgh	2.20c to 2.50c
Cold finished steel bars, Pittsburgh base	2.50c to 2.65c

Rails, Track Material

Standard bessemer rails, mill	**$45.00**
Standard open-hearth rails, mill	**47.00**
Relaying rails, St. Louis	25.00 to 30.00
Relaying rails, Pittsburgh	**30.00 to 35.00**
Light rails, 25 to 45, mill	1.85c to 1.90c
Angle bars, Pittsburgh base	**2.75c**
Angle bars, Chicago base	**2.75c**
Spikes, railroad, Pittsburgh	2.85c to 3.00c
Spikes, railroad, Chicago	3.38c
Track bolts, Pittsburgh	3.50c to 4.00c
Track bolts, Chicago	**4.38c to 4.73c**
Tie plates, Pittsburgh	2.00c to 2.50c
Tie plates, Chicago	2.30c

Wire Products

100 lbs. jobbers, carloads; retailers, 10c more

Wire nails, Pittsburgh	$2.75
Plain wire, Pittsburgh	2.50
Galvanized wire, Pittsburgh	3.00
Barbed wire, painted, Pitts.	2.90
Barbed wire, galv., Pittsburgh	3.40
Polished staples, Pittsburgh	2.90
Galvanized staples, Pittsburgh	3.40
Coated nails per count keg, Pitts.	2.35

Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	5.90c
Sheet piling base, Pittsburgh	1.80c to 1.90c
Hot rolled strip steel, Pittsburgh stamping quality	2.40c to 2.60c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.00c to 4.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.00c to 3.25c
No. 28, bessemer, Pittsburgh	3.00c to 3.25c
No. 28, open-hearth, Phila.	3.35c to 3.60c
No. 28, open-hearth, Chicago	3.38c to 3.63c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.00c to 3.50c
No. 28, open hearth, Chicago	3.38c to 3.88c

GALVANIZED

No. 28, open-hearth, Pittsbgh	4.00c to 4.25c
No. 28, bessemer, Pittsburgh	4.00c to 4.25c
No. 28, open-hearth, Phila.	4.35c to 4.60c
No. 28, open-hearth, Chicago	4.38c to 4.63c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.40c to 2.65c
No. 10, bessemer, Pittsburgh	2.40c to 2.65c
No. 10, open-hearth, Phila.	2.70c to 3.00c
No. 10, open-hearth, Chicago	2.78c to 3.03c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$ 5.50 to 5.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers Carloads

	Black	Galv.
1 to 3-inch, butt steel	64½	52
1 to 1½-inch, butt iron	39½	24½

Boiler Tubes

Steel, 3¼ to 13 inches, c. l.	**52 off**
Carcoal iron, 3½ to 4½ inches, c. l.	27 off

Prices Past and Present

Representative market figures yesterday, one month ago, three months ago and one year ago

	Aug. 3, 1921	July, 1921	May, 1921	Aug., 1920
PIG IRON				
Bessemer, valley, del., Pittsburgh	$21.96	$22.96	$26.06	$49.50
Basic, valley, del., Pittsburgh	19.96	20.86	23.96	49.40
No. 2 Foundry, val. del., Pitts.	21.46	22.06	25.56	49.65
No. 2 Foundry, Chicago	18.50	19.35	22.85	46.00
Lake Superior charcoal, Chicago	35.50	36.85	38.50	57.50
Malleable, valley	**20.00**	20.40	24.10	48.25
Malleable, Chicago	18.50	19.35	23.35	46.50
*Southern No. 2, Birmingham	19.00	20.25	22.50	42.00
Southern Ohio, No. 2 Ironton	**20.00**	20.50	24.50	46.50
Basic eastern del. eastern Pa.	21.50	22.25	25.00	47.40
**No. 2X, Virginia furnace	24.00	24.50	27.00	49.25
**No. 2X, eastern del. Phila.	20.85	23.50	26.10	51.00
Gray forge val. del. Pittsburgh	19.46	20.56	24.86	47.80
Ferromanganese, 80 per cent, del.	**75.00**	75.00	83.00	193.75
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	32.00	34.00	39.00	70.00
Sheet bars, open-hearth, Pitts.	32.00	34.00	39.00	71.25
Billets bessemer, Pittsburgh	30.00	32.25	37.00	61.25
Billets, open-hearth, Pittsburgh	30.00	32.25	37.00	61.25
FINISHED MATERIAL—				
Steel bars, Pittsburgh	1.75	1.85	2.10	3.25
Steel bars, Chicago	2.03	2.28	2.48	3.52

	Aug. 3, 1921	July, 1921	May, 1921	Aug., 1920
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.10	$2.15	$2.35	$4.75
Iron bars, Chicago mill	1.75	1.96	2.45	3.75
Beams, Pittsburgh mill	1.80	1.90	2.20	3.15
Beams, Philadelphia	2.15	2.15	2.55	3.50
Beams, Chicago	2.18	2.33	2.58	3.52
Tank plates, Pittsburgh	1.75	1.85	2.20	3.50
Tank plates, Chicago	2.13	2.33	2.58	3.77
Tank plates, Philadelphia	2.15	2.15	2.55	3.625
Sheets, blk., No. 28, Pittsburgh	3.25	3.35	4.00	7.00
Sheets, blue anl., No. 10, Pitts	2.40	2.55	3.10	5.00
Sheets, galv., No. 28, Pittsburgh	4.25	4.35	5.00	7.50
Wire nails, Pittsburgh	**2.75**	2.85	3.10	4.00
COKE—				
Connellsville furnace ovens	**2.75**	2.75	3.25	17.75
Connellsville foundry, ovens	4.00	4.45	4.85	18.25
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	**12.00**	12.00	13.65	27.75
Heavy melting steel, eastern Pa.	11.75	11.25	11.80	24.10
Heavy melting steel, Chicago	10.75	10.55	11.50	24.15
No. 1 wrought, eastern Pa.	**14.50**	14.75	15.25	33.25
No. 1 wrought, Chicago	**10.00**	10.25	11.85	28.50
Rerolling rails, Chicago	11.75	12.45	13.25	38.00

*1.75 to 2.25 silicon **2.25 to 2.75 silicon.

Pig Iron Inquiries on Increase

Some Interest Shown in Forward Requirements and Bookings Are More Active—Sharon Melter Buys 2000 Tons of Basic at $18, Valley—Ohio Silveries Reduced $8—Sentiment Generally Better

Philadelphia, Aug. 2.—The heaviest tonnage in months was placed on the eastern pig iron makers' books during the month of July. Eastern Pennsylvania makers have taken a total of 25,000 to 30,000 tons during that period, much of it in this district and much also for New York and New England districts. Apparently as the result of the less aggressive competition of Buffalo makers, eastern makers are showing less of a disposition to repeat some of the low prices done in the past week. Trading in that period brought out $20, and even as low as $19, eastern Pennsylvania furnace on actual sales of No. 2 (1.75 to 2.25 silicon) both plain and No. 2X (2.25 to 2.75 silicon) with only a little higher for No. 1X (2.75 to 3.25 silicon). In some sases prices as low as $18.50 to $19 furnace, for No. 2 plain have been done, but there is some doubt as to whether such prices were in connection with bona fide offers. Nothing lower than $19 to $20 appears to have been a factor in the market. The present minimum appears to be $19.50, furnace, with a tendency again to ask for a differential of at least 50 cents on No. 2X over No. 2 plain. In a few cases some second half tonnage was placed, but consumers buying at the lowest prices for nearby delivery were refused when they sought to place tonnage to the end of the year at these figures. Some malleable was sold at $22.50, eastern Pennsylvania furnace. Gray forge and basic are nominal.

August Shipments Improve

Cleveland, Aug. 2.—August shipments of pig iron are starting off at an increased rate and producers are being led to believe from various indications that the month will prove to be the best in tonnage moved in a considerable period. Some interests state they expect to ship in August from certain plants fully 100 per cent more than in July. The tonnage forwarded in July was barely equal to that in June which in turn was less than in May. Buyers are coming into the market a little more freely but still principally for carloads. No trace of buyers' interest in future shipments yet is to be seen. One producer in the week sold 1100 tons in small lots and another about as much while a third disposed of around 500 tons. One producer with furnaces along the lakes and in the valleys is reported holding to $20, furnace, for the base or lower grades and another to $20.50, base, valley. All the reported sales of the week were on this basis. Occasional buyers report their ability to obtain iron under $20, furnace. A 100-ton sale of southern iron to this territory was made at $19, Birmingham or $25.66, Cleveland. The American Radiator Co. again was in the market this week inquiring for 1400 tons for Detroit and 250 tons for Springfield, O.

Will Blow In Furnace

Buffalo, Aug. 2.—A local furnace will blow in on one stack this week and operate for about a month on basic. One local seller has taken about 1000 tons of foundry during the week at $19 to $21. A furnace reports inquiry of 2900 tons and sales of less than 300 tons. Most of this iron was other than No. 2 grade (1.75 to 2.25 silicon). The 2.25 to 2.75 silicon product was sold at $22, the 3.25 to 3.75 silicon at $23 and as high as $25 was obtained on very high silicon iron.

Now Ship From Stock

Chicago, Aug. 2.—The movement of pig iron during the past week shows improvement and foundries are covering for current requirements. Inquiry is more widespread; production which all season has exceeded sales in the past few days has fallen noticeably behind and deliveries are being made from stock. The Maysville, Wis., furnace of the Steel & Tube Co. of America was blown out Friday, cutting down merchant foundry iron production in this district about 50 per cent. The attitude of most furnaces is to cut production and to wait for a shortage to develop in attempting to stiffen prices. Some steel companies well stocked with foundry iron are willing to make concessions on round tonnages. The reduction in silveries by Jackson county, O., producers so far has been without effect, except to cause Red river makers to meet the new prices. Recently quotations against 100 tons of 7 per cent silicon brought out prices below the Jackson county figure. A price of $34 for a moderate tonnage of charcoal iron was underbid in one case.

Buys Basic at $18

Pittsburgh, Aug. 2.—Prior to blowing in its blast furnace last week, the Sharon Steel Hoop Co., purchased 2000 tons of basic pig iron at $18, valley, from a valley steelworks. No inquiries for basic are before sellers although a few small ones for bessemer iron continue to be issued from time to time. This usually involved single carloads although one from Canada came in recently for 100 tons. Most of this business including the latter order had been closed on basis of $20, valley. Compilations made by W. P. Snyder & Co. of the sales prices prevailing in bessemer and basic pig iron during July reveal the following averages: $20.875 on bes-

semer and $18.802 on basic. This compares with $23 and $20.70 respectively for June and $24.25 and $21.875 respectively for May. Small lots of foundry iron only continue to be sold on the basis of $19 to $19.50 valley for the No. 2 grade (1.75 to 2.25 silicon). No sizable inquiries are current, buyers continuing their policy of supplying their immediate wants in the spot market in lots of from 50 to 100 tons. Occasionally, as much as 200 or 250 tons are bought. Some blast furnaces are being blown in and others are contemplating but in every case steelworks furnaces are involved. The Pittsburgh Steel Co. blew in one at Monessen a week ago and last Saturday the Lowellsville, O. stack of the Sharon Steel Hoop Co. was placed in operation. The Wheeling Steel & Iron Co. contemplates blowing in one at Wheeling shortly.

Sentiment Is Improved

Boston, Aug. 2.—While a distinct improvement in sentiment is noticed in the pig iron business in New England the actual volume of business during the past week has been the smallest of the year. Many of the large Connecticut foundries are closed and in Massachusetts operations are continuing at the bare minimum. For the most part consumers are out of the market. The situation with the smaller consumers can be summarized in the operations of a central Massachusetts plant which normally melts about 65 tons of pig iron a day, but is now handling only 16 tons. No general disposition to shade prices is evident. On the contrary one large Eastern Pennsylvania furnace is understood to have announced an advance of $2 in price, taking the position that it is time to stop selling iron for less than cost. No business has been done on this basis locally, however. On the contrary, it is reported a quotation of $20 furnace on Eastern Pennsylvania iron was rejected in favor of a lower bid, but whether this was resale or not is not known. A small lot of lake charcoal iron has been sold, the price not stated, but it is understood a round tonnage would go at $35 furnace. Inquiries seem slightly larger. A large Massachusetts textile interest is in the market for 700 tons of special analysis iron, which has not yet been placed and a Rhode Island foundry seeks 100 tons. A central Massachusetts foundry is in the market for 200 tons of 2.75 to 3.25 silicon iron and another inquiry for 200 tons is pending.

Second Half Buying Increases

New York, Aug. 2.—Pig iron buying reflected an increase in volume during the past week here. Bookings of foundry iron aggregated at least 3500 to 4000 tons. At least 1500 tons of this total is for shipment over the remainder of the year. Consumers are showing increased interest in forward requirements and of about 2500 tons involved in current inquiries, 1000 tons are for second half. Prices paid for second half iron now are about the same as is being paid for prompt and nearby deliveries. Most of the trading here is the past week involved eastern Pennsylvania foundry, which went at prices ranging from $20 to $20.50 and $21, furnace, both for 1.75 to 2.25 and 2.25 to 2.75 per cent silicon. In some cases the furnace refused to duplicate these figures. Quite generally, however, the silicon differentials are being waived on attractive business for the present. In at least one case 2.75 to 3.25 silicon was sold at the same price as 1.75 to 2.25. An Easton, Pa., consumer is in the market for 500 tons of 1.75 to 2.25 silicon for nearby shipment. One eastern Pennsylvania furnace in July sold five times as much iron as in the whole of June. This is not saying as much as seems apparent, as the total for June was small as compared with other months this year. Other makers, however, also had much larger bookings in July than they had for June, and there is no mistaking the fact that demand is on an increasing scale. Reports from the foundries are favorable. A large number of eastern foundries are operating at a bigger rate than a few weeks ago. Some of them have booked orders of late which enable them to operate to full capacity. Prospects for a continued good pig iron demand, therefore, are considered good. The American Manganese Mfg. Co.

Composite Market Record

Monthly Averages of Fourteen Products, 1913-1921, Compiled by The Iron Trade Review

1921	
July 27	$ 36.69
July 20	37.55
July 13	38.61
July 6	39.69
Average for July	38.14
June 29	40.79
June 22	41.23
June 15	42.15
June 8	42.45
June 1,	42.71
Average for June	41.87
May	43.32
April	43.84
Mar.	45.37
Feb.	48.81
Jan.	51.98

1920	
Dec.	53.45
Nov	63.75
Oct	68.61
Sept.	68.86
Aug.	68.87
July	68.69
June	68.29
May	68.66
April	67.49
Mar.	65.47
Feb.	65.63
Jan.	59.40
Average for year	65.60

1919	
Dec.	55.2(
Nov.	52.3:
Oct.	45.16
Sept.	48.75
Aug.	48.67
July	48.26
June	48.28
May	48.69
Apr.	48.85
Mar.	52.68
Feb.	53.71
Jan.	53.81
Average for year	50.37

1918	
Dec.	$ 57.17
Nov.	55.63
Oct.	57.49
Sept.	56.56
Aug.	56.67
July	56.66
June	56.62
May	56.59
April	56.59
Mar.	56.71
Feb.	56.67
Jan.	56.67
Average for year	56.67

1917	
Dec.	56.68
Nov.	58.29
Oct.	67.75
Sept.	83.18
Aug.	89.69
July	89.56
June	82.66
May	73.96
April	66.48
Mar.	61.07
Feb.	56.76
Jan.	55.10
Average for year	70.10

1916	
Dec.	53.68
Nov.	46.77
Oct.	41.50
Sept.	39.97
Aug.	39.67
July	39.37
June	39.63
May	39.78
April	39.13
Mar.	37.18
Feb.	35.63
Jan.	33.66
Average for year	40.50

1915	
Dec.	$ 31.56
Nov.	28.64
Oct.	26.19
Sept.	25.55
Aug.	24.77
July	24.25
June	23.74
May	22.89
April	22.66
Mar.	22.71
Feb.	22.21
Jan.	21.90
Average for year	24.76

1914	
Dec.	21.58
Nov.	23.39
Oct.	22.84
Sept.	23.17
Aug.	22.72
July	22.17
June	22.58
May	22.99
April	23.39
Mar.	23.60
Feb.	23.52
Jan.	23.03
Average for year	22.92

1913	
Dec.	23.29
Nov.	24.02
Oct.	24.91
Sept.	25.55
Aug.	25.97
July	26.34
June	26.78
May	27.34
April	27.74
Mar.	27.93
Feb.	28.05
Jan.	27.96
Average for year	26.32

just has booked an order for 450 tons of 1.75 to 2.25 silicon foundry for the Washington navy yard, at $25, delivered, for iron with a maximum of .06 sulphur.

Reduce High Siliceous Sharply

Cincinnati, Aug. 2.—Furnaces in the Jackson county district have announced a reduction of $8 on silveries, and $8.50 on bessemer ferrosilicon. The new schedule of prices is as follows: Silveries, 6 per cent, $25; 7 per cent, $27; 8 per cent, $27.50; 9 per cent, $29.50; 10 per cent, $31.50; 11 per cent, $34; 12 per cent, $36.50. Bessemer ferrosilicon, 10 per cent, $36.50; 11 per cent, $39.80; 12 per cent, $43.10; 13 per cent, $47.10; 14 per cent, $52.10. On the other hand there appears to be a slight firming tendency in foundry pig iron. Southern Ohio No. 2 iron still is available at $20 and $20.50, Ironton, and considerable tonnage has been sold during the past week at these figures. The furnace booking the business has refused to make contracts covering the remainder of the year under $21. Another producer declares that it is offering no iron below $22. Small lot buying continues to increase in volume and it is probable that the aggregate of sales in the past week has been largely in excess of any like period since the beginning of the depression. More inquiries also have been current, but these have not been for more than carload lots save in two instances where consumers have sought quotations on 100 tons each.

Production To Be Increased

Birmingham, Ala., Aug. 1.—Pig iron quotations in the South continue weak. With production held down and a little selling, there has been a reduction of surplus stocks to such an extent that several of the furnace interests may be short on some grades. To prevent this resumption of operations is under consideration. The Woodward Iron Co. is to blow in a furnace this week. The company then will have two stacks on foundry iron, the only two independent furnaces in operation in the district. The Tennessee Coal, Iron & Railroad Co. has four furnaces on basic iron. Quotations of pig iron in this district are down to $19 for No. 2 foundry (1.75 to 2.25 silicon). While consumers are buying for immediate needs they are manifesting no interest as to the future. Concessions are asked for by consumers when they enter the market with tonnages of more than two or three cars and report has it that a large sale was made on a basis of $18 per ton. The Sloss-Sheffield Steel & Iron Co. has a large supply of iron on hand and can meet all demands for some time. Little iron is expected to be sold outside of the immediate southern territory because of railroad freight rates, but there is a feeling that some rate reductions are to be made before long. Cast iron pipe plants, sanitary pipe works, radiator plants, stove works and two or three small foundries are still buying in hand-to-mouth fashion. Nine furnaces are in condition for operation on 24 hours' notice. All have plenty of raw material on hand.

Foundry Inquires for 1100 Tons

St. Louis, Aug. 1.—A St. Louis foundry is inquiring for 1100 tons of pig iron, the largest tonnage sought by any melter in this district in a considerable time. According to the selling agencies recent inquiries inspire more confidence in the immediate future of the market. Buyers are issuing them for the purpose of actually acquiring the tonnages specified. In a small way the general demand for mill and foundry products is broadening. Nothing in the way of real tonnage is being bought, but the orders are quite large in the aggregate, and are increasing the size of the average daily melt. The past two weeks have witnessed heavier buying in the South, notably in the rural districts. Castings, parts and materials for making repairs are in greater demand and the movement is expected to gain momentum through August. Advices relative to the cotton crop vary considerably, but no doubt exists that the total yield will be 30 to 40 per cent under that of a year ago. In southern Missouri, Arkansas and Oklahoma the outlook is better than elsewhere. Collections in the winter wheat areas have showed decided improvement, and the outlook for fall trade is good. Prices for pig iron continue soft and decidedly uncertain. Some business has been done below anything thus far recorded on the present downward movement. The leading local producer continues to quote $21.25, delivered, St. Louis. It is stated that $18, Chicago, was done for 1.75 to 2.25 per cent silicon, and more could be had on that basis. Stocks of local makers are fairly large. Buying by the stove plants is confined to carlots for immediate delivery.

Coke Demand Improving

Lighting of Blast Furnaces Creates More Activity—Pipe Maker Engages Tonnage—Foundry Cut at Boston—New York Market Stronger

COKE PRICES, PAGE 266

Pittsburgh, Aug. 2.—More activity is noted this week among beehive coke ovens, and more coke is being consumed. This is brought about by the blowing in of a blast furnace by the Pittsburgh Steel Co., at Monessen, Pa., and one by the Sharon Steel Hoop Co., at Lowellville, O. The former will supply its coke requirements from its operations at Alicia. The Sharon company, the trade understand, is covered by a contract for Connellsville coke. It is not divulged whether this is a new contract or a reinstatement of an older arrangement. The Sharon company, however, recently negotiated with several producers on the basis of 11,000 to 12,000 tons monthly for the balance of the year and then stated that a quotation of $3 was too high. Among the inquiries for furnace coke for other than blast furnace purposes is one calling for five carloads. The business probably will be closed at a price below $2.75, since standard furnace coke is not required. Another inquiry from an eastern source calls for 500 tons. The spot furnace coke market is quotable at $2.75 to $3. The H. C. Frick Coke Co., all of whose ovens are idle, has again reduced wages 10 per cent, effective Aug. 1. This brings wages approximately to the level of Nov. 10, 1917. Demand for foundry coke is intermittent. One brand of foundry coke, the production of which has called for the continuous operation of 150 ovens for some time, was reduced this week from $4.75 to $4, ovens. While a good grade of foundry coke can be bought around $3.75, other brands are selling at $4.25 and $4.50. The spot market is quotable at $3.75 to $4.50. A cast iron pipe maker which has not been buying coke for many weeks, came into the market this week and producers may be forced to light more ovens to supply its needs. Production, according to the Connellsville Courier, for the week ending July 23, totaled 21,500 as compared with 21,480 tons the preceding week.

Some Improvement Expected

Boston, Aug. 2.—The New England quotation on foundry coke was reduced today by local producers from $10.91 to $10.66. Little change has been noted in the volume of business moving. Stocks are understood to be running low and the disposition is to look for some improvement shortly.

Wants 2200 Tons of Foundry Coke

Cincinnati, Aug. 2.—A western industry is in the market for 2200 tons of 72-hour foundry coke, for which business there is considerable active competition. Small tonnage business is improving, but apparently is having little effect on the market. Prices are unchanged. The belief is growing that there will be no further scaling down.

Tone Somewhat Improved

New York, Aug. 2.—A stronger tone is reflected in the foundry coke business here. At least two beehive interests who were doing as low as $3.75, Connellsville, net, have refused to sell at less than $4. The market as a whole may be quoted at $4 to $4.50, Connellsville. Special brands continue to bring orders at $5. Coke sellers here report increased trading in foundry fuel for shipment through September and October. The Seaboard By-Products Coke Co. continues to quote $4.50, Connellsville, on by-product foundry coke for August shipment.

Contracting Smallest on Record

St. Louis, Aug. 1.—Coke buying still is confined to small tonnages for immediate shipment. Furnace grades are especially dull, with prices weak. The only stacks in blast are those of the St. Louis Coke & Chemical Co., which manufactures its own fuel. This interest reports it is shipping its current make of coke and has a fair demand for its domestic sizes. Foundries are indifferent as to future supplies, and contracting for the last half is the smallest ever known here at this time of year. The range on Connellsville foundry coke is $3.75 to $4.25 ovens, though special brands have sold up to $5 in small amounts.

Bar Aggregate Is Larger

Numerous Small Tonnages Swelling Volume of Business—1.70c Done on Merchant Steel—Refined Iron Reduced to 2.25c

BAR PRICES, PAGE 266

Chicago, Aug. 2.—The price of soft steel bars, which is nominal at 2.13c, Chicago, is subject to some variation depending on the tonnage asked for. Hope for a pronounced increase in demand has been fufilled and one interest says sales during the week have fallen off slightly. Reports of transactions at 2.00c Chicago are frequently heard. Conditions are so quiet that an order for 500 tons some times is sufficient to cause a mill to start up. The desire to continue leads to offers of concessions in an attempt to secure additional tonnage. Hard steel bars are without feature, although a large purchase of rerolling rails by one interest is thought to indicate increased production.

The bar iron market is quiet and production is lower than a week ago. In the absence of large tonnage there seems to be little if any price cutting.

Sale Made at 1.70c

New York, Aug. 2.—Two carloads of steel bars were booked by one of the leadiing independent mills during the past week at 1.70c, base, Pittsburgh, or $1 per ton less than the 1.75c price which has been regarded as the market. This order was taken in conjunction with a tonnage of plates. On usual business 1.75c base, is being done. Important tonnage is lacking, and the market is not being tested out in an active way. While 1.65c, Pittsburgh, has been reported as done on a fair lot of iron bars, confirmation of this is lacking, and it appears that the market continues steady at 1.75c.

Two Tonnages Placed

Buffalo, Aug. 2.—One order has been obtained in this district for 800 tons of soft steel bars. Another order was for 400 tons, placed with a local sales agency. Carload business is reported to be improving.

Refined Iron Bars Reduced

Pittsburgh, Aug. 2.—Reports of concessions under 1.75c, base Pittsburgh, on merchant steel bars appear to be unfounded so far as the producers here are concerned. Apparently that price is holding more firmly than is 1.85c on plates and shapes. Bar producers are not willing to shade 1.75c for the small amount of business offered. Sales at present chiefly comprise 50 to 100 tons, although many orders placed are for smaller tonnages. One large valley bar producer obtained orders for approximately 800 tons, made up of small lots, last week, and business this week started out on the same basis, the first order calling for 70 tons. The New York Central railroad wants about 150 tons.

Refined iron bars are lower, being reduced from 2.50c to 2.25c, base Pittsburgh. Inquiries have increased slightly and small sales are made more frequently. A demand for refined iron for staybolts is noted in connection with the various railroad repair programs. Low phosphorus melting bars still are quotable at 5.00c, base Pittsburgh.

Ford Purchases 800 tons

Pittsburgh, Aug. 2.—While it was reported that the Ford Motor Co. entered the market recently for approximately 3000 tons of cold-drawn steel bars, it appears that the figure was much too high, although the tonnage may have included other kinds of steel. That company purchased last week approximately 800 tons of cold-drawn steel, but considerable cold-drawn wire was included. It is understood that this bar business went at a concession under the prevailing price of 2.65c base Pittsburgh. The fact that some business recently placed went at 2.50c makes the market quotable at 2.50c to 2.65c, base Pittsburgh. The 2.50c price gives $15 for conversion when 1.75c on hot bars is considered. It is generally understood that the American Steel & Wire Co.'s price still remains at 2.75c, base Pittsburgh, on cold-drawn bars.

Total of Demand Increasing

Philadelphia, Aug. 2.—The total of steel bar demand shows a slight increase in this district. Current sales apparently are all at 1.75c base. Business of a character to afford thorough test is lacking. Consumers seem waiting to see if this figure is firm.

Number of Sales Larger

Cleveland, Aug. 2.—New business in steel bars is in better volume but the tonnage is made up of numerous lots and sizable purchases are few. Some of the business in bands which recently has been up in this territory has been closed. Reports that some mills have named as low as 1.90c Pittsburgh on bands appear to be unfounded. Where some mills have quoted 1.90c on a bar car base with band extras, the net price is about 2.20c, Pittsburgh. The range in the market seems to be from 2.20 to 2.40c, Pittsburgh. Steel bars are well maintained at 1.75c, Pittsburgh.

Nut and Bolt Inquiries Again Fall Off

NUT AND BOLT PRICES, PAGE 324

Pittsburgh, Aug. 2.—That a wide open market exists on nuts, bolts and rivets, with quotations made depending upon the character and size of the inquiry, is generally conceded. Only few inquiries are current and typifying the condition in the trade the Pittsburgh Screw & Bolt Co. practically will be shut down until Sept. 1 unless a revival in business precedes that date. Other plants either operate partially one week and shut down the next or operate only two or three days a week, according to the way business comes in. Users' needs are not heavy and only small inquiries are issued and orders placed are even smaller in many cases. The usual discount on carriage bolts, rolled thread, 3/8 x 6 inches, as well as smaller and shorter, is 65 and 10 off, but that and other regular discounts are understood to be nominal. While one case where 2.40c and 2.50c was quoted on structural and boiler rivets, respectively, is noted, some other sales this week have been made at 2.65c and 2.75c.

New Market Established

Philadelphia, Aug. 2.—Cutting of bolt and nut prices of late has led to the establishment of the eastern market at 65 and 10 to 70 off for large bolts. One order recently was booked at 78 off but this was on some exceptionally good track supply orders.

Cheerfulness Continues

Cleveland, Aug. 2.—The better feeling which has prevailed in the bolt, nut and rivet market in this district is continuing, despite the occasional shading of prices which is encountered on attractive business. One maker of bolts and nuts in this city reports July was the best month for orders and shipments it has had since January. Interest is being maintained in the New York Central railroad's buying this week of track bolts and nuts as well as in the general run of small inquiries and orders before the trade. A local rivet maker continues to quote 2.75c and 2.85c for structural and boiler rivets, respectively, although others have shaded these levels.

Steelworks Operations in Valley Increase

Youngstown, O., Aug. 2.—Operating schedules this week at steelworks throughout the Mahoning valley show a substantial increase over those maintained during the past seven months. Sheet mill operation reached 52 per cent of capacity and this rate is expected to be maintained throughout the week. This is the best showing in this branch of the industry since Dec. 13, 1920 when 62 per cent of sheet mill capacity was engaged.

Five additional open-hearths at plants of independent steelmakers were placed on line this week, bringing the rate up to 45 per cent of capacity. The increase in operating conditions is due largely to an accumulation of orders and to the demands of the trade for immediate delivery, although two companies report their present mill schedules represent new business.

Of the 55 active sheet mills, the Trumbull Steel Co. has 12; the Brier Hill Steel Co., Newton Steel Co. and Youngstown Sheet & Tube Co., 10 each; the epublic Iron & Steel Co., eight, and the Sharon Steel Hoop Co., five.

With the Republic Iron & Steel Co. starting six open-hearths after having its steelmaking departments idle for five weeks, the number of active independent units now totals 23. Other operators of open-hearths in the valley this week include the Trumbull Steel Co., with two, Brier Hill Steel Co. with seven, Youngstown Sheet & Tube Co. with five and Sharon Steel Hoop Co. with three.

Blast furnace capacity now engaged includes seven steelworks stacks, the Sharon Steel Hoop Co. having lit its Mary furnace at Lowellville, O., late last week. The Youngstown Sheet & Tube Co. and the Carnegie Steel Co.

have two stacks each in blast, while the Republic Iron & Steel Co. and the Brier Hill Steel Co. have one each blowing. The rate of blast furnace operations in the Mahoning valley is now 26 per cent of capacity.

The Youngstown Sheet & Tube Co. is operating its bessemer department this week and two tube mills. The Trumbull Steel Co. has six hot tin mills and its strip departments in action. The Republic Iron & Steel Co. has four bar mills, two skelp and three tube mills rolling, and its bessemer converters blowing.

Ore Shipment 16,000,000 Tons Behind 1920

ORE PRICES, PAGE 324

Cleveland, Aug. 2.—Shipments of Lake Superior iron ore this season to Aug. 1 amount to approximately 10,220,000 tons, as compared with 26,079111 tons in the same poriod last year. Shipments last month were about 3,850,000 tons, the last two days' tonnage being estimated, against 9,638,606 tons in July, 1920.

Most of the shippers are sending along some tonnage on contracts, but the open market business continues to be extremely limited. It develops that another cargo of approximately 10,000 tons has been sold to the St. Louis Coke & Chemical Co., in addition to the sale made to this interest and reported two weeks ago. In all, about 30,000 tons have now been placed at St. Louis by two ore shippers. The largest inquiry in the market this week is one for 5000 to 10,000 tons of ore, on which a leading interest has quoted the regular prices.

Still Curtailing Work

Duluth, Aug. 2.—Miners on the Minnesota ranges have cheerfully accepted the 10 per cent wage reduction made by the Oliver Iron Mining Co., effective Aug. 1. Operations on the ranges are being further curtailed and it is predicted that August shipments down the lakes will make the poorest showing this year. Some operators are hoping for better conditions in the ore trade by late fall, but no plans for resumption are being made. An encouraging feature of the situation is the fact that stock piles are being shipped out from some mines.

Meets Independent Price

New York, Aug. 2.—Official confirmation was made today by Chairman E. H. Gary, of the United States Steel Corp., of recent reports that the Steel corporation is meeting new low prices quoted by independent mills. When his attention was called to an article in a financial paper here today, Judge Gary said:

"The statement published in the *Wall Street Journal* Aug. 2 concerning prices of steel products is substantially correct with the modification that our subsidiaries have not made any reductions excepting to meet prices of leading independent manufacturers. Prices generally would have reached the low point as many if not most of the manufacturers are at present selling below cost of production."

Plate Prices Are Easier

Sales Made at 1.75c and 1.80c—Miscellaneous Tonnage Increasing—Western Tank Inquiries Promising Some Business

PLATE PRICES, PAGE 266

Philadelphia, Aug. 2.—Current plate business is small and not sufficient to afford a test of how firm is the present price of 1.85c, Pittsburgh. Requirements are being held up by customers. It is felt that buying will result at the present price if the mills show they are in earnest in adhering to it. Business in the past week included a number of small lots, amounting to as much as 200 tons each. All these apparently went at 1.85c, eastern mill. Operations range from 15 to 25 per cent. Bids have been opened on the Torresdale pipe line, Philadelphia, requiring 430 tons of plates. No action has been taken as yet on the Red D boats or the Akron pipe line tonnages. The feeling with respect to prices is reflected by one eastern maker who says: "Increases in transportation over prewar costs amount to $7.85 per ton; fuel and supplies, $7.10, and wages, $5.64, a total of $20.59. Subtracting this from a price of $44.80 per gross ton at 2.00c per pound leaves $24.21 or 1.08c per pound. Taking the 1.85c base price this reduces the price on plates to the equivalent of about 95c per 100 pounds. The average price for 10 years before the war was 1.51c per pound."

Competition Is Keen

Pittsburgh, Aug. 2.—On the small amount of plate business offered, competition is keen and various prices under the 1.85c, base Pittsburgh, have been done. Small sales have been made at 1.80c, and the impression seems to prevail that tonnage business would bring out a lower price. One of the local steel companies which buys its plates for fabricating purposes closed for an additional lot of 200 tons, but price details are not available. A typical inquiry calls for 4000 plates, and is issued by one of the forging companies. Steel producers believe that with the financial condition of the railroads improving car and locomotive repairs as well as new business will be stimulated, which will increase the demand for plates and other steel. Some fabricators report an improved inquiry for tanks from the Wyoming, Colorado and Louisiana territories, which may lead to some plate tonnages later. The East Jersey Pipe Co., a subsidiary of the T. A. Gillespie Co., of this city, has received a contract for a 48-inch steel pipe line for Akron, O., requiring about 2500 tons.

Railroads Buying Quietly

Chicago, Aug. 2.—The increase in railroad buying looked for 10 days ago has not materialized in this district, but nearly all railroads are taking a keen interest in prices and are continuing their repair programs, at least as extensively as early in June. It seems to be the desire of most companies to keep purchases quiet and orders are split into small lots and distributed throughout the trade. Many of the roads are repairing their own cars and are buying plates for this purpose in 50 and 100-ton lots. They feel that to be advertised as in the market for large tonnages would tend to boost the price. The price of 1.85c, Pittsburgh, is being well maintained.

Sale at 1.80c

New York, Aug. 2.—On a sale involving about 200 tons of plates in this district during the past week one of the leading independents quoted 1.80c base, Pittsburgh, or $1 a ton lower than the 1.85c figure which has been regarded of late as representing the market. Small business has gone at 1.85c, base.

Prices Are Not Firm

Cleveland, Aug. 2.—Plate makers in this territory have been booking plate business in better total tonnage, the orders invariably being small. Scarcely a day has passed without various inquiries from the railroads though these are being kept to minimum amounts. One inquiry for 550 tons for export has been current and it has been stated 1.75c Pittsburgh would not be attractive. The market is not firm and any attractive business is going around 1.75c Pittsburgh though some fair orders at 1.85c are reported in the local market.

Tin Plate Sales

Relatively Light at This Time—Specifications Fair

TIN PLATE PRICES, PAGE 266

Pittsburgh, Aug. 2.—Users of tin plate continue to specify against their contracts but new buying continues to hold off. The tin plate and canning industries as a rule do not look for any real improvement during the remainder of this year now that the turn of the year has come. They expect, however, that 1922 will make up for the lack of business now prevailing. Regular customers are taking from one to 10 carloads weekly on old commitments whereas their requirements ordinarily are much larger. The Shenango plant of the American Sheet & Tin Plate Co. continues on the same basis as last week, namely 29 out of 35 tin mills operating. Among the independent producers the general average seems to be 25 per cent of capacity, with many mills entirely idle and some operating in excess of 25 per cent. The general price named is $5.75 per base box of 100 pounds, Pittsburgh, although $5.50 likewise has been done on production plate.

Sales Made at $5.25

New York, Aug. 2.—Tin plate prices continue to be shaded on current trading. It is not difficult to buy at $5.50, per base box, Pittsburgh, and in some cases attractive business has been booked at $5.25. Some of the makers continue, however, to quote $5.75 as their minimum.

Scrap Shows Some Activity

Steel Mills Take Limited Tonnages in Some Markets Although in Others Dullness Continues—Only a Few Prices Are Changed

SCRAP PRICES, PAGE 328

Chicago, Aug. 2.—Each week buyers and sellers alike look for indications that the low ebb in prices has been passed, but although nearly all agree the bottom is near, some grades continue to ease off slightly. Railroads are offering tonnage too freely to permit anything like a shortage. The Atchison, Topeka & Santa Fe has a list out offering approximately 2000 tons of miscellaneous scrap. The Michigan Central has issued its customary blank list which is thought to cover a sizable tonnage. The Chicago & Northwestern has issued a new list calling for 1000 tons. The Wabash is selling a miscellaneous lot of scrap got from old cars which are being repaired at the Hegewisch, Ill., plant of the Western Steel Car & Foundry Co. Quotations against the New York Central list a week ago were reported as in line with the quoted market, and in no case to show any unusual interest on the part of buyers. Heavy melting steel, which a week ago showed a rebound in price, is available in the present market at $10.75 per gross ton, which represents no further advance over the old price. Sales during the week have been of small tonnage only and the total, if anything, is less than it was a week ago.

Several Carloads Sold

Boston, Aug. 2.—Several cars of No. 1 machinery scrap have been sold in this district at $16.50 to $17 delivered, but aside from this little business has been moving. An inquiry is pending for a carload of car wheels, and dealers are quoting $17.50 to $18 on this grade. No disposition to shade prices is observed and quotations are unchanged.

Some Small Buying Done

New York, Aug. 2.—Although scrap prices are weak, no changes have been noted during the past week. A little buying of heavy melting steel continues by one or two eastern Pennsylvania consumers and some demand from foundries exists for cast scrap, but aside from this the market is listless. Of all the grades in the local market, it appears the greatest firmness, considering the past few months, has been in cast scrap, the prices having changed relatively little. This is attributed to fairly steady buying by the foundries.

Market Decidedly Dull

Pittsburgh, Aug. 2.—Nothwithstanding reports of improvement in operating schedules here and there in this district, not much reflection is seen in the scrap market. The Pittsburgh Steel Co.'s action in blowing in a blast furnace at Monessen, Pa., and the starting up of its six open hearths there possibly will mean the release of some suspended scrap contracts but it means no new buying since large scrap stocks still are on hand at that point. The West Penn Steel Co. is offering 50 cents per ton less this week than last for heavy breakable cast but this bid is not attractive to dealers or brokers. No real live inquiry exists for scrap at present and it is extremely difficult to dispose of any which may be picked up. Yard tocks remain practically untouched since they have been accumulated at prices too high to permit selling at the present market levels. Railroad malleable is quoted 50 cents less than a week ago, or at $11.50 to $12, while rerolling rails have been marked up 50 cents, to $14.50 to $15.

Offers $10 for Heavy Melting

Buffalo, Aug. 2.—The situation in this scrap market is slack. A minimum of trading is being done and most dealers have decided to allow the market to drift. A little heavy melting steel is filtering into one mill here which has been offering $10, but this is small in volume, less than 500 to 600 tons being represented. All other grades are experiencing dullness.

Mills Do Some Buying

Cleveland, Aug. 2.—An increase in the number of inquiries, the release by some mills of orders held up some time ago and the buying of some small lots of steel mill scrap has given the local market a more cheerful outlook. Few of the tonnages moving have been in excess of 100 to 200 tons, the majority running to carload lots. Prices have not been changed on any grades in the past week.

Some Activity at Detroit

Detroit, Aug. 2.—Buying and trading between dealers seemed to make up most of the activity in the iron and steel scrap market last week. Consumers are filling only immediate needs, and as a result the demand still is weak. Axle turnings are down to $5.50, but other items have held their own despite adverse conditions.

Trading at a Minimum

St. Louis, Aug. 1.—While the underlying feeling among dealers continues fairly hopeful, actual trading is at a minimum. Consumers are taking next to nothing; most of the mills are not turning a wheel. With one exception mill interests are not buying for their future needs, and the exception is picking up only a few tons here and there which look unusually cheap. A canvass of leading consumers last week elicited the information none cares to speculate, even at present low prices. They point to the high interest rates, and say they may have to carry material bought now for six months before working it up.

Inquiries Are Noted

Birmingham, Ala., Aug. 1.—Some inquiries for scrap are reported but outside of stove plate and No. 1 cast there is not much buying. A better feeling is noted and belief is now expressed that some sizable contracts, as compared to what has been done for several weeks past, will be closed in the next week or two. Dealers are more confident. All quotations still are weak. The stock of stove plate and No. 1 cast still is not extensive. The smaller iron rolling mills have been operating during the past few weeks but their stock of old material on hand has been sufficient to keep them going.

Steelmakers Buy Scrap

Philadelphia, Aug. 2.—Three steelmakers in this district have been buying scrap in the past week or two in scattered lots. The purchases included steel borings and stove plate. Rolling mills bought considerable wrought pipe. The leading cast iron pipe maker bought 1000 tons of cupola cast. Generally the demand is somewhat better and the tendency is for sales to be made at firm prices as dealers believe an advance is coming and are disinclined to shade.

Warehouse Prices Are Reduced Further

WAREHOUSE PRICES, PAGE 324

New York, Aug. 2.—Quotations in the local jobbers' market have declined, the reduction extending to chain, boiler tubing and wire and wire products, which have been unchanged for some time past. On such descriptions as shapes, plates, hoops, bands and bars, the reductions amounted to about 15 cents on 100 pounds, on cold-rolled materials, 20 cents, and on sheets and a few other materials, 25 cents. On chain and wire and wire products, the reductions were greater. No particular improvement in demand, however, has resulted. The changes were made largely to conform with the reduction in mill prices.

Prices Reduced Again

Philadelphia, Aug. 2.—Local iron and steel jobbers have reduced prices on all iron and finished steel products for shipment out of stock. Base prices on the more important products now are as follows: Steel bars 2.75c, iron bars 2.65c, plates and shapes 2.85c, blue annealed sheets 3.50c, black sheets 4.25c, galvanized sheets 5.25c, round cold-rolled steel 4.40c, iron bands 3.90c, steel hoops 3.65c, steel bands 3.40c. Jobbers report the number of orders in this district is showing an increase, but the total volume has not changed materially.

$3 Reduction is Made

Cleveland, Aug. 2.—With demand for iron and steel materials out of stock continuing to show but small improvement, jobbers in this district have again revised prices. The reduction approximates about $3 a ton and although placed in effect on July 29, as yet has not resulted in a stimulation of business. Steel bars are now quoted 2.64c; structural shapes, 2.74c, and plates, 2.74c. Sheet prices are holding at the levels previously established and no further reductions are expected at this time.

More Detroit Reductions

Detroit, Aug. 2.—Some further revisions of prices out of warehouse in this district have been made within the past few days. New prices for

most products were issued more than a week ago, but leading pobbing interests now are quoting blue annealed sheets at 3.48c and iron bars at 2.83c, which are lower figures.

By-Product Sales

Continue Light—Production Equals Demand—Prices Remain Unchanged

New York, Aug. 2.—The coal tar by-products market is unchanged with demand coming out in sufficient volume to absorb production of most descriptions, and prices holding firmly. The principal interests now in the market are the paint and varnish manufacturers, and rubber makers, who are closing on benzol and solvent naphtha, and the lacquer and dye manufacturers, who are buying solvent naphtha and also a fair quantity of toluol. The drug trade, which recently was buying naphthalene in fair quantities, has virtually withdrawn from the market, with the result that little naphthalene is now moving.

Coke Oven By-Products

Spot	
Per Gallon at Producers' Plants	
Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31
Per Pound at Producers' Plants	
Phenol	$0.15 to 0.17
Naphthalene, flake	$0.075 to $0.085
Naphthalene, balls	$0.085 to $0.095
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.20 to $2.50
Contract	
Pure benzol	$0.27 to .33
Toluol	.28 to .34
Solvent naphtha	.25 to .31
Per Pound at Producers' Plants	
Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	nominal

Pure benzol for spot and future shipment is holding at 27 cents per gallon, producers plants, for material in tanks, and 31 to 35 cents, in drums; 90 per cent is quoted at 25 cents in tanks, and 28 to 31 cents in drums; toluol, 28 cents in tanks and 31 to 34 cents in drums; and solvent naphtha at 25 cents in tanks and 28 to 31 cents in drums. Phenol is quoted for spot delivery at nominally 15 to 17 cents, producers plants.

Owing to lack of demand on the part of the farmers, the market on sulphate of ammonia remains listless. A few foreign inquiries are noted from time to time, but this is materializing in little actual business. Quotations still range from $2 to $2.50, delivered, seaboard.

Tool Builders To Meet

Oct. 18, 19 and 20 are the dates set for the annual convention of the National Machine Tool Builders' association to be held at the Hotel Astor, New York.

Close on Sheet Contracts

Increase in Buying for Last Quarter Noted in Valley, as Prices Appear More Stable—Diversified Demand Growing—Operations Gain

SHEET PRICES, PAGE 266

Youngstown, O., Aug. 2.—Sheet mill operation this week shows an increase of 22 per cent over last week's schedule and is the highest rate of activity since the week beginning Dec. 13, 1920. The increase reflects a backlog of orders rather than new business, although one company states its present rolling schedule is made up largely of orders booked recently. One company increased operations to prevent losing a few hundred tons of black sheets for export requirements of several weeks standing. Consumers of sheets are beginning to show interest in contracting for their requirements over the last quarter. As far as can be ascertained the mills show practically no inclination to take advantage of the situation at present prices, although the tendency of buyers toward future contracting is held by sheet producers to be a promising indication of an early resumption of business. Price reductions appear to have run their course and the market now seems settled at 2.40c for blue annealed, 3.00c for black and 4.00c for galvanized, Youngstown. Some makers, however, still are quoting 3.25c on black and 4.25c on galvanized, operating costs not permitting them to go lower. Inquiries still are confined to small tonnages.

Small Tonnages Pending

Philadelphia, Aug. 2.—A considerable number of sheet tonnages are pending, but most of them are not in excess of a carload or two. Some hesitancy is shown in placing orders, due to price uncertainty. The price of 2.40c for blue annealed is being shaded, but not generally. On the other hand, many small blue annealed orders are going at 2.65c, base Pittsburgh. The price of 3.00c is being shaded on black sheets, but not generally. While some galvanized sheet tonnages are going at 3.00c to 3.25c, base Pittsburgh, the bottom of the market seems to be 4.00c.

Diversified Demand Grows

Pittsburgh, Aug. 2.—That sheet business is increasing is the consensus of opinion of producers here. Jobbers are buying black and galvanized sheets, indicating that stocks are getting low. This increased demand has led to a slight increase in operations of sheet mills. The American Sheet & Tin Plate Co. is operating about 40 per cent of its sheet mills, with prospects of more being added shortly. Other sheetmakers, particularly union mills, are increasing their schedules now that the wage basis has been settled. With the leading interest, both galvanized sheets for car-roof repairs and automobile sheets are in good demand. No. 22 sheets for automobile bodies are quoted at 4.70c, Pittsburgh. Some little demand for electrical sheets continues to be noted, but large users still have sizable stocks and only buy to round them out. Metal lath manufacturers continue to purchase fair quantities of sheets. Japan continues to be a large importer of American steel, particularly thin sheets, 31½ and 36 gage. Concessions are heard on various lots of business placed although these chiefly are traced to districts outside of the immediate Pittsburgh territory. Prices here generally are 2.40c, 3.25c and 4.25c on blue annealed, black and galvanized sheets, respectively. The Steel corporation still maintains 2.65c, 3.50c and 4.50c on these grades. Prices under these maximums, particularly on black and galvanized, have been reported in the Mahoning valley.

Tonnage Shows Increase

Cleveland, Aug. 2.—New tonnage taken by mills in this territory has undergone a considerable enlargement and operations are correspondingly increased. The Riverside plant of the Otis Steel Co. is on a 50 per cent basis this week. Automotive interests have been responsible for a considerable part of the going business.

Hoop Demand Dormant

Pittsburgh, Aug. 2.—Demand for hoops and bands remains dormant. Users either have stocks on hand or their manufacturing programs are much curtailed. Buying is for immediate needs only and orders usually involve one or two carloads. While the lowest quotation heard on hoops is 2.40c, base Pittsburgh, the price range still is 2.40c to 2.60c, some producers not caring to go below 2.60c on the limited amount of business offered. The practice of quoting bar card extras on a bar base price of 1.90c, Pittsburgh, for bands which is equivalent to about 2.20c Pittsburgh net on bands is not general so far as can be learned.

Company Organized To Develop Coke Oven

New York, Aug. 2.—The Belgian-American Coke Oven Corp. is the title of a new company organized to introduce and develop in this country by-product coke ovens of the Piette type. The new company whose organization just has been completed, has a capital of $10,000,000 preferred stock and 200,000 shares of common stock of no par value. The new company will have offices at 23 Broad street, New York.

Directors include Thomas P. Ryan, Emil Francqui, president of the Banque d' Outremer and director of the Societe Generale of Belgium; F. S. Landstreet, associate of Mr. Ryan; Oliver Piette, president; Hector Prudhomme of Brussell s vice president; Herbert H. Vreeland, associate of Mr. Ryan; Oliver Piette, inventor of the oven; G. H. Walker, president of W. A. Harriman & Co.; Adolphe Stoclet, representing Belgian interests; Lambert Jadot, director of the Banque d' Outremer, and William H. Page, general counsel.

Shape Buying Still Light

Reported Placing 7000 Tons with Two Pittsburgh District Makers, at Low Prices, Features Market—Western Lettings Small

SHAPE PRICES, PAGE 266

Cleveland, Aug. 2.—The structural market again is approaching the dull status which for so long characterized the market last spring. While several fairly sizable school jobs are active, the majority of projects before fabricators involve only small tonnages. An exception was the power house for Ashtabula, O., bids on which were opened last week with the McClintic-Marshall Co., low bidder. No award has been made. It is understood the Mt. Vernon Bridge Co. finally has placed 7000 tons of plain material part of which is for the Ohio stadium at Columbus, with two steelmakers in the Pittsburgh district. The report puts the price for this steel around 1.60c, Pittsburgh.

Railroad Buys 450 Tons

New York, Aug. 2.—New structural inquiries of importance comprise about 2500 tons and include a lot of 1000 tons for an office building in Philadelphia. The largest order reported involved 450 tons for miscellaneous work for the Florida East Coast railroad. Prices on shapes remain fairly steady, with some mills quoting nominally as high as 1.85c, Pittsburgh.

Harbor Job Is Pending

Philadelphia, Aug. 2.—The Dupont Engineering Co., Wilmington, Del., is low bidder on the Wilmington harbor job involving a large tonnage of shapes, plates and bars. Since the bids were rejected the first time, some building requirements have been added to this project. Bids are to be opened Aug. 15, on the contract for the George Washington hotel, Washington, Pa., and the contract for a building for Temple university, Philadelphia, both involving considerable tonnage. The current shape business here is comparatively small and while the 1.85c price is being adhered to every one is waiting to see how it bears up under a real market test. The Phoenix Bridge Co. is operating all departments this week, to some extent.

Offers to Buy Large Tonnage

Pittsburgh, Aug. 2.—Negotiations now are in progress on the part of the Mt. Vernon Bridge Co. which was awarded the Ohio State university stadium job. This company is endeavoring to present an order for approximately 7000 tons of structural material, exclusive of reinforcing bars, to two or three producers here at 1.65c, base Pittsburgh, but so far as can be learned the order has not been placed. All orders this week coming to the fabricators involve small tonnages, the largest being a 3-span girder railroad bridge involving 100 tons. A large number of projects still are held in abeyance. A motion picture theatre as well as a hotel at Somerset, Pa., and a hotel at Washington, Pa., each will require 200 or 300 tons. One local project nearing the closing point is the Fifteenth street bridge, requiring 1000 to 2000 tons of structural material. The shape market still is quotable at 1.70c to 1.85c, base Pittsburgh.

Several Small Jobs Placed

Chicago, Aug. 2.—Some structural tonnage is up for fall figuring. Current work is small, but the construction companies are hopeful of an increasing tonnage being placed in the near future. Several small tonnages have been placed in the past week, mostly projects for western cities.

CONTRACTS AWARDED

Telephone exchange, Stamford, Conn., 300 tons, to Porcupine Boiler Co., Bridgeport, Conn.

Miscellaneous work for Florida East Coast railroad, 450 tons, to independent shop.

Three-span girder railroad bridge from Stephan Sanford & Co., 100 tons to the McClintic-Marshall Co.

Viaduct, Racine, Wis., 170 tons, to Worden-Allen Co.

Water works, Des Moines, Iowa, 110, to an independent fabricator.

Girder spans, Prairie Dupont, Ill., 121 tons, to the American Bridge Co.

Store building, Salt Lake City, 189 tons, to the American Bridge Co.

Theater building, Wichita, Kans., 136 tons, to Christopher & Simpson.

Atlas Life building, Tulsa, Okla., 655 tons, to the Kansas City Structural Steel Co.

CONTRACTS PENDING

Office building, Philadelphia, 1000 tons, pending.

Hospital, Hackensack, N. J., 600 tons, bids being asked.

Savings bank, Fifty-seventh street, New York City, 400 tons, pending.

Motion picture theater and hotel at Somerset, Pa., and hotel at Washington, Pa., approximately 300 tons each, contract pending.

Fifteenth street bridge, Pittsburgh, between 1000 and 2000 tons, contract pending.

Filtration plant, Charlotte, N. Y., 200 tons; bids asked.

Apartment house, San Francisco; 150 tons; M. V. Politeo, First National Bank building, San Francisco, taking bids.

Concrete Bar Needs Are Less Numerous

New York, Aug. 2—New projects involving concrete reinforcing bars are not so numerous at present. Most of those which have come up involve small tonnage. More school buildings are pending in this district than structures of any other kind; these involve generally from 30 to 50 tons each. The Newark Athletic club, Newark, N. J. involving 200 tons of bars, for which the George A. Fuller Co. booked the general contract, has been held up. The Ulen Contracting Co., New York, is in the market for 200 tons of bars for the aqueduct at Shandaken, N. Y. Current prices on concrete bars for mill shipment now range from 1.70 to 1.85c, base, Pittsburgh, depending on the size of the tonnage. The contract for 830 tons of bars for the Federal Reserve Bank building, New York, has gone to the Pardee Steel Corp. This company will make deliveries in accordance with daily specifications.

Reinforcing Bar Sales Light

Pittsburgh, Aug. 2.—Small sales of reinforcing concrete bars continue and these usually involve from 50 to 150 tons with the regular price of 1.75c, base Pittsburgh, as the common quotation. Data are not available here as yet with reference to the large tonnage of reinforcing bars required in the Ohio State university stadium.

Local producers have hopes that the bars for the Baldwin reservoir, Cleveland, may yet be purchased in Pittsburgh now that new bids are requested. Kingan & Co., meat packers, are to erect a reinforced concrete structure at 1121-23 Penn avenue, this city. Sidney F. Heckert is architect and it is estimated that the building will require about 300 tons of bars.

CONTRACTS AWARDED

Federal Reserve building, New York, 830 tons, to Pardee Steel Corp.

CONTRACTS PENDING

Acqueduct at Shandaken, N. Y., 200 tons. Bids being taken by Ulen Contracting Co., New York.

Auto Makers Maintaining Scheduled Output

Detroit, Aug. 2.—Operating schedules at the plant of the Dodge Motor Co. this week will include 500 passenger cars daily. The Ford Motor Co. expects to maintain its output between 4500 and 4700 cars daily and the General Motor Co. at its Buick plant, about 450 cars daily. The majority of the stamping companies will operate their plants three to four days per week. The plants of the Murry Body Co. and the Fisher Body Co. here will operate this week at full capacity. Rumors prevail in automobile circles that passenger car production again will be curtailed in the next 30 to 60 days unless general business conditions throughout the country show more signs of improvement. Employment in Detroit factories is steadily on the increase, according to the weekly report of the Employers' association. For the week ended July 26 there was a net increase in employment of 2175 men among 79 firms reporting.

Delay Basing Point Case

Washington, Aug. 2.—Indication are it will be September or possibly later before hearings on the federal trade commission's Pittsburgh basing point complaint are begun, although the original plan called for the taking of testimony early in August. Commission attorneys still are in the Northwest preparing their case, and Chairman Thompson of the commission, the most active factor in issuing the complaint, is in the West and will not return until Sept. 1. According to Acting Chairman Gaskill, a date for the hearing has not yet been tentatively fixed.

May End Bankruptcy

Birmingham, Ala., Aug. 1.—As soon as reorganization and refinancing have been completed, efforts will be made to obtain contracts in commercial steel fabricating for the Birmingham Steel Corp. The United States shipping board has under consideration settlement of all claims by this company, a subsidiary of the Mobile Shipbuilding Co., and the plant may pass

into private ownership this month. The bankruptcy proceedings are being terminated by a cash payment on indebtedness of 20 per cent and the balance in three, six and nine months.

Nail Buying

Continues in West and Mill Operations are Somewhat Greater

WIRE PRICES, PAGE 266

Chicago, Aug. 2.—Nail stocks are low throughout the West and distributors are being forced to buy for the fall trade. Sales and mill operations have increased during the past week. Railroads are not buying wire as freely as was expected but the rural demand for fencing has increased and the outlook is good. Prices are maintained.

Demand Keeps Up Well

New York, Aug. 2.—Buying of wire and particularly wire nails keeps up well in this district. In some quarters there is a disposition to believe the good demand for wire and nails is due to a considerable extent to the fact that the prices on these products have not been shaded, except in comparatively few cases, with the result that consumers are less disposed to hold up their orders for wire and nails than for other products on which concessions had been made. The market continues to be quoted at 2.50c, base, Pittsburgh, for wire and 2.75c for nails.

Nail Demand Drops Off

Pittsburgh, Aug. 2.—While week before last some little improvement was noted in the demand for wire and wire products, this market again has fallen into a state of lethargy. Wire mill operations are not increasing any and apparently the jobbers making an effort to fill up their stocks have succeeded to the extent of satisfying themselves they are fitted to meet the limited demand which may come up. All know that prompt deliveries are possible from the mills so none are buying heavily at one time. Reports of 2.50c, base Pittsburgh, on nails emanating chiefly from buyers, find no basis in makers' quotations, the nail price remaining firm at 2.75c and plain wire at 2.50c, base Pittsburgh.

Mixed Business Is Better

Cleveland, Aug. 2.—Miscellaneous wire business is better though the improvement is not pronounced. Jobbers in this territory still are not very prominent in the market. Reports continue current of some shading of prices up to 25 cents per 100 pounds in both nails and wire but it is difficult to establish these positively. It is reported sales have been made in this territory on a mill base which would be less than the regular Pittsburgh price plus the freight.

Ore Booklet Is Issued

An attractive booklet giving the average cargo analyses of Lake Superior iron ore shipped in 1920 has been issued by the Lake Superior Iron Ore association. The booklet, compiled by W. L. Tinker, secretary of the association, gives the averages of all the mines which were operated. Two months' delay in issuing it was caused by the printers' strike.

Many Car Repairs Placed

Railroads Award 8000 to Builders—New York Central Opens Bids on Track Material—Rail Export Inquiries Aggregate 50,000 Tons

RAILROAD PRICES, PAGE 266

New York, Aug. 2.—Contracts for the repair of 2500 cars have been placed by the New York Central as follows: 500 box to the Standard Steel Car Co., 500 box to the Streator Car Co., 500 box to the Ryan Car Co., 500 hoppers to the American Car & Foundry Co., and 500 hoppers to the Buffalo Steel Car Co. The Pittsburgh & Lake Erie has awarded the repair of 1000 hoppers to the Standard Steel Car Co. and 500 box cars to the Pressed Steel Car Co. The Big Four has awarded the repair of 1000 cars to the American Car & Foundry Co.; the Michigan Central, it is reported, placed an order for the repairs of 500 box cars with the Illinois Car & Mfg. Co.; and the Lake Erie & Western, 500 box cars with the Haskell & Barker Car Co. Further car repair orders include 1500 cars for the Delaware, Lackawanna & Western, of which 500 went to the Buffalo Steel Car Co., 500 to the American Car & Foundry Co., and 500 to the Magor Car Co. The Lehigh & New England has placed an order for the repair of 300 box cars with the Middletown Car Co. Some additional car repair business is under contemplation, but has not as yet developed into actual inquiry.

The New York Central yesterday opened bids publicly on a large amount of track equipment, the low bidders on which were as follows: The Railroad Supply Co., $45 per net ton, West Seneca, N. Y., and Gary, Ind., on 5000 to 10,000 tie plates for 80-pound rails and 40,000 to 80,000 tie plates for 100-pound rails; the Illinois Steel Co., 2.75c per pound, Joliet, Ill., on 5000 to 12,000 angle bars for 80-pound rails and 7500 to 15,000 angle bars for 100-pound rails; the Jones & Laughlin Steel Co., 2.50c, Youngstown, on 15,250 to 22,000 kegs of track spikes; and the Bourne Fuller Co., 3.25c, Cleveland, with 15-cent extras, and the Buffalo Bolt Co., 3.15c, North Tonawanda, N. Y., with 25-cent extras, on 22,750 to 31,900 kegs of track bolts.

Good-sized orders for track accessories have been placed during the past week. The most substantial orders were placed by the Atlantic Coast Line, the Southern and the Illinois Central. Other roads also placed orders but on a smaller scale.

Indications are seen in current inquiries here from abroad, of an increasing world wide demand for railroad materials. Many roads in different countries have put out inquiries for rails and track accessories and it is expected the development of the orders in each case will depend on the financing of the business. Current foreign inquiries for rails aggregate well over 50,000 tons. The Netherlands government is inquiring for 12,000 tons of rails for Java. The Peking-Mukden railroad in China opened bids July 29 on 17,000 tons of rails. Several rail inquiries have been put out from Brasil and the Chilean government is in the market for a substantial rail tonnage. The Norwegian state railways are inquiring for 12,000 tons of rails, but it is expected that this business will be placed in Germany.

Car Repairs Expected

Philadelphia, Aug. 2.—The Pennsylvania railroad is expected to come out for some car repairs some time in August. Other eastern and southern roads are said to be on the point of issuing car repair inquiries. The light rail demand is good. The largest inquiry is from the Lackawanna railroad's mine department which wants 2000 tons. Current prices seem to be 1.85c to 1.90c, base, on new rails and $39 to $40 per gross ton on rerolled rails.

Coal Mines Order Sparingly

Pittsburgh, Aug. 2.—Coal mine operations, while not improving greatly, are witnesing some little activity and this brings a limited number of light rail orders. Small purchases of one or two carloads at a time are noted by one large interest here on the basis of 1.90c, base Pittsburgh, although others report that their price, 1.85c, does not bring them the business in the face of competition from rerollers who are quoting 1.75c or lower. Several inquiries involving from 100 to 500 tons of relaying rails are noted and 85 or 90-pound sections are being quoted at $31.50. Lighter sections are higher, quotations varying all the way up to $35.

Interest is keen in the opening of bids by the New York Central on its 22,000-keg inquiry. The Pennsylvania's recent purchase amounted to 3000 kegs instead of 7000 as reported. An inquiry from the Erie for 1000 kegs likewise is before local makers. Standard spikes are quoted at 2.85c, while makers have no difficulty in getting 3.00c, base, for the smaller sizes. The plates are quoted at 2.00c to 2.50c, base Pittsburgh. A few railroads are asking for small lots of track bolts and other material. Track bolts are quoted at 2.50c to 4.00c, base Pittsburgh, the latter price being quoted late last week on an inquiry for 250 kegs. The price of 3.60c has been done on a less than carload lot.

Buys Malleable Plant

The Glauber Brass Mfg. Co., Superior avenue and East Forty-ninth street, Cleveland, has bought and will move into the plant recently vacated by the National Malleable Castings Co. at Platt avenue and East Seventy-ninth street, Cleveland. The property adjoins the Pennsylvania railroad, contains eight acres and comprises 26 buildings. The consideration is said to have been $750,000. The Glauber company, owned and operated by Morris H. Glauber, was organized in 1889 and continuously has made water, gas, steam and plumbing goods. The National Malleable company some time ago moved into its new plant at Quincy avenue and Woodhill road, Cleveland.

Billet Inquiries Expand

Buyers Interested in Larger Tonnages of Both Billets and Slabs— Sheet Bars Reported Available at $30 or Less

SEMIFINISHED PRICES, PAGE 266

Pittsburgh, Aug. 2.—Several sellers and producers of semifinished material in this territory report that no inquiries are before them for sheet bars, billets or slabs. This market has been quiet for many weeks, but a further falling off in demand is noted. Some producers have regular customers taking sheet bars, and one buyer reports being able to place his business at $30, although the general price is understood to be $32. Plate mills which must buy their slabs report they are not paying the $31 price, and are able to place business at below $30. Rerolling billets, 4 x 4 inches, are quoted at $30, which puts forging billets at a $35 level, although no sales are known to have been consummated. Not even inquiries are before makers which would serve to bring out the market prices.

No demand exists for wire rods which are quoted at $42, base Pittsburgh, or for skelp, at around 1.85c or 1.90c, base Pittsburgh.

Withdraws Inquiry

Philadelphia, Aug. 2.—The semifinished market is dull. The N. & G. Taylor Co., Cumberland, Md., inquired for a tonnage of sheet bars but withdrew.

Asking for Larger Lots

Youngstown, O., Aug. 2.—A slightly better demand for billets and slabs exists in this territory. While recent inquiry involved 100 or 200 tons, consumers now are asking for quotations on lots of 1200 or 1500 tons. Good sized orders involving several hundred tons of slabs were placed here last week. Prices of a week ago continue to be maintained. Billets, 4 x 4 inches and larger are quotable at $30, slabs at $31 and sheet bars at $32, Youngstown. Demand for sheet bars continues slight and practically all that makers have to work on are specifications against long-standing contracts.

Sharp Concessions Are Reported

Cleveland, Aug. 2.—Considerable concessions from the reduced basis of semifinished prices recently put in effect, continue to be reported. As previously stated, slabs have been quoted under $30, Pittsburgh or Youngstown. Instances of sharp shading on sheet bars also are a subject of discussion. One of these concerned a reported price of $30, Chicago, and in another case, an Ohio maker is said to have quoted far under this figure at the mill, where a long haul was involved. A Milwaukee buyer has been negotiating for some sheet bar tonnage. A local plate maker has bought against a recent inquiry for 2500 tons of slabs.

Strip Shows Improvement

Pittsburgh, Aug. 2.—Some slight improvement in both inquiries and sales of hot and cold-rolled strip steel is noted by producers in this district. Individual orders do not as yet run into tonnage but requests for one or two carloads are becoming more numerous and in the aggregate represent a considerable amount of steel. These are coming mostly from automobile and automobile parts makers although a few of the hardware interests are ordering small lots, particularly in the New England territory. Confidence on the part of buyers to the extent of placing orders for future delivery still is absent and all buying is for immediate or rush shipment, everybody buying for absolute requirements only. Some producers to get business are shading under the 4.25c price on cold-rolled, going to 4.00c, base Pittsburgh, and the same condition applies to hot-rolled, with a spread of 2.40c to 2.60c, base Pittsburgh, representing the quotable market.

Ferromanganese

Sales in Week Total 350 Tons—Tariff Bill Stimulates Some Inquiry

FERRO PRICES, PAGE 324

Philadelphia, Aug. 2.—The ferromanganese business in the past week aggregated about 350 tons. The asking price was around $75 delivered although sellers might consider firm offers at lower figures. Consumers who have sought big reductions, however, have met refusals. Considerable inquiry induced by the passage of the tariff bill by the house is pending and some is expected to be placed. Spiegeleisen is dull and is quoted at $27 to $30 furnace.

Some Ore Is Sold

Philadelphia, Aug. 2.—Some Brazilian manganese ore has been sold out of stock in carloads at 30 cents per unit but the market on cargoes continues nominal at 22½ cents to 24 cents per unit.

Prices Generally Weak

New York, Aug. 2.—Prices of the special alloys generally are weak. It now is possible to buy ferrovanadium of low silicon content at $5 a pound contained, although the leading maker is maintaining its base price for high silicon alloy at $5. Resale material has been reported offered as low as $4.50. Some 50 per cent ferrosilicon has been sold at $65, delivered. Ten to 15 per cent ferrosilicon is quoted $35 to $36. New business in ferrochrome has been almost at a standstill; some foreign alloy has been sold out of stock in small lots at 12.50 to 13 cents a pound contained, 6 to 8 per cent carbon. Domestic makers continue to quote 14 to 15 cents. Some small lots of ferrotungsten have been sold at 50 cents a pound contained. Tungsten metal powder is quoted 55 to 60 cents. The increased duties provided in the new tariff bill, now before the senate, have had little effect excepting to make buyers cautious about committing themselves to orders with possibility of increased duties.

Interest Is Low

Pittsburgh, Aug. 2.—In the absence of pressing need for alloys, users are not showing much interest in the market. The general thought is that before the tariff bill becomes a law, modifications and revisions will be made and that since this all takes time they have plenty of opportunity to place orders before prices advance. Buyers continue to fill absolute needs and as indicated no tendency exists to anticipate requirements. The Brier Hill Steel Co. recently entered the market for a carload of 50 per cent ferrosilicon. Sellers of that commodity are finding it more difficult to obtain business, even at $65, delivered, although some are unable to quote below $68, delivered. Outside of a few lots of ferromanganese asked for practically no interest is noted in that alloy. Domestic makers quote around $75, delivered, although reports of shading are current. Importers are quoting English at $68, seaboard, and German at $64, f.o.b. Pittsburgh. Spiegeleisen is quoted as low as $25 on sizable tonnages. The only inquiry now before sellers calls for 100 tons. Some sellers of ferrochrome state that they are unable to stir up any interest even with a quotation of 12 cents.

Pipe Market

Quiet in Both Iron and Steel Grades— Several Sizable Jobs Pending

PIPE PRICES, PAGES 266 AND 324

Chicago, Aug. 2.—In the absence of large tonnage, prices of cast iron pipe hold close to the established level of $49.10 at Chicago for the 4-inch grade. Inquiry continues to be encouraging and awards during the past week probably bring July into first place for the year in the matter of tonnage. On July 22 Detroit rejected all bids on 335 tons of 4-inch pipe but on July 29 opened bids covering 1500 tons of 8-inch pipe on which the Lynchburg Foundry Co. was the low bidder, and the award to this concern was recommended. On Aug. 5 Detroit will open bids covering 100 tons of 6-inch pipe for the fire commissioners. Milwaukee on July 25 opened bids covering 225 tons of 16-inch pipe, the contract for which was awarded to the National Cast Iron Pipe Co. Minneapolis takes bids tomorrow on 206 tons of 6-inch and 12-inch pipe. Saginaw, Mich., opens bids tomorrow on 840 tons of 6-inch and 12-inch pipe. On Aug. 3 Medina, O., received bids on 10 tons of 4-inch and 6-inch pipe and on Aug. 8 Hammond, Ind., opens bids on a large quantity of 36-inch pipe. At the same time Bay City, Mich., opens bids on a sizable tonnage of 24 and 30-inch pipe. Most observers feel that August will continue to show gradual improvement in municipal work.

1500 Tons Are Pending

New York, Aug. 2.—This city has revived its specifications for the water improvement work, involving approximately 1500 tons, and will close bids on the general contract tomor-

row. Two lots actually are involved, one amounting to about 400 tons and the other, 1050 tons. They are comprised principally of 6, 8 and 12-inch pipe, although there are some sizes as high as 20 inches. Little else in the way of municipal demand is pending. Prices on the general run of small business are unchanged, with concessions being made where the tonnage is especially desirable.

Lettings Slow Up

Birmingham, Ala., Aug. 1.—Lettings for cast iron pipe are quieter but contracts in hand call for steady operation of plants in this district for some time to come. Shipment of pipe is at a better pace than at any time this year but new business is not of any consequence. Some additional lettings are looked for during this week. Reports are current cast iron pipe makers have been in the pig iron market and that one or two companies here have placed orders for a considerable tonnage.

Tubular Demand Is Fair

Pittsburgh, Aug. 2.—Coming chiefly from jobbers who are filling up their stocks, the demand for tubular goods remains fair. This improvement applies in the main to standard steel pipe, both lapweld and buttweld, and possibly would indicate an improvement in the building industry. Pipe mill operations have not had to be increased, however, so that the improvement so far is not measurable. An occasional inquiry for line pipe is issued which generally is the occasion for price cutting although the discounts on standard pipe appear to be firmly held.

The A. M. Byers Co. on July 27, with a card dated July 7, reduced its price on wrought iron oil country pipe, $8 per ton on small sizes of tubing, $10 per ton on 2-inch pipe and $12 per ton on casings, drill pipe, drive pipe, etc. Since the reductions on wrought iron pipe went into effect, considerable improvement in the orders from jobbers is noted.

Puddlers Back on 1919 Wage Scale Basis

After a week of discussion at the Drake hotel, Chicago, representatives of the Western Bar Iron association and of the Amalgamated Association of Iron, Steel and Tin Workers agreed on an annual wage scale July 30. Employers and employes returned to the 1919 scale Monday, Aug. 1. This scale represents a reduction of from 9 to 15 per cent below the present which provides a wage of $5.50 per ton for boiling when the average sales price of bar iron for the preceding two months is 1 cent per pound; $11.02 when 2 cents; $16.02 when 3 cents, and $21.02 when 4 cents.

Some disappointment is expressed by makers over the relatively small average reduction, but at least one mill which has been holding off in operation awaiting the decision, is said to be planning to resume operation during the week. Many details of the settlement still are to be worked out.

Apply for Charter

Noteholders of the Seaboard Steel & Manganese Co. who recently bid in the furnace of that company at Temple, Pa., have applied for a Pennsylvania charter under the name of the Temple Furnace Co. This action was taken in order that there may be a formal, corporate body to which title to the furnace may pass in the event of the confirmation of the sale.

The Nonferrous Metals

Quotations Continue To Decline—Little Activity in Any Product Except Copper Tubing and Wire—Expect Some Buying Soon

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel shot
July 27.....	12.12½	12.37½	26.25	4.40	4.22½	22.00	4.65	40.00
July 28.....	12.12½	12.37½	26.50	4.40	4.22½	22.00	4.65	40.00
July 29.....	12.00	12.37½	26.50	4.40	4.20	22.00	4.65	40.00
Aug. 1.....	12.00	12.25	26.62½	4.37½	4.20	22.00	4.50	40.00
Aug. 2.....	12.00	12.12½	26.37½	4.37½	4.20	22.00	4.50	40.00

†Open market quotation.

NEW YORK, Aug. 2.—Metal prices have continued to fall steadily in the past week, with activity at a minimum in practically all metals. Some new low prices have come out but they have failed to stimulate more than curiosity. In some products, especially brass rolling mill products, there appears to be slightly more interest and a number of small orders are being given. Seamless brass and copper tubes are the most active part of the trade, except possibly copper wire. A little business is going in brass and copper sheets, but not much.

Copper products, including sheets and wire, were reduced ½c a pound again the latter part of last and the fore part of this week by all mills. This action is in line with the new metal market. Brass products have not been cut, largely because they are being rolled mostly from scrap cartridge shells which have been moving from the government to mills at a very cheap figure on a monthly basis. As the quantity left with the government now is less than an average month's deliveries, it is thought mills soon will have to enter the markets for new metals. This action may have a strengthening effect, as part of the weakness of copper and zinc has been due to lack of domestic business in this period in which mills have been operating mostly on scrap. Mill products are sold at prices well below the published base quotations for all but the smallest lots. Competition is keen.

Tin went as low as 26 cents last week, and then followed London up, but today was down again, as low as 26¼ cents. Little buying by users is noted.

Zinc sold as low as 4.15c East St. Louis at the end of last week, after a little strength had appeared. The market the past two days has been dull around 4.20c.

Lead prices have shown little change in the past week. Users appear to be anxious for deliveries on old contracts, but new buying is lacking.

Aluminum is weak, continuing at the 25 cents base, from the producer, and 22 cents in the outside market. Little new business is going.

Mill Products

SHEETS		
Copper, hot rolled, 24 oz., minimum	20.00	20.25
High brass		15.75
Zinc, ga. 9 to 18 (plates ½c less)		10.00
Lead, full sheets (cut ¼c more)		7.75
SEAMLESS TUBES		
High brass		18.50
Copper		21.00
RODS		
High brass, round, ⅜ to 2½ in.		13.75
Naval brass rod		16.75
WIRE		
Copper	14.125	14.25
High brass		16.75

Dealers' buying prices on old metals follow:

Old Metals

HEAVY RED BRASS		
Chicago		7.25
Cleveland	7.50	8.00
New York	8.00	8.25
HEAVY YELLOW BRASS		
New York	4.50	4.75
Chicago		5.25
Cleveland	4.50	5.00
ZINC		
New York	2.50	2.75
Cleveland	1.50	2.00
Chicago		2.75
HEAVY COPPER AND WIRE		
Cleveland	8.50	9.00
Chicago		8.25
New York	9.00	9.25
RED BRASS TURNINGS		
New York	6.25	6.50
Cleveland	6.00	6.50
Chicago		6.50
YELLOW BRASS TUBING		
Cleveland	3.50	4.00
NO. 1 BRASS ROD TURNINGS		
Cleveland	3.50	4.00
New York	4.00	4.25
Chicago		4.50
ALUMINUM BORINGS		
Cleveland	4.00	4.50

Pig Iron Output Drops Heavily

July Production Totals Only 864,580 Tons, Reaching New Low Point—Nonmerchant Tonnage Shows Sharp Reduction Representing 82.3 Per Cent of Total Loss—Five Additional Furnaces Are Blown Out

OUTPUT of coke and anthracite pig iron set a new low record in July when the tonnage produced fell under the million-ton mark for the first time since monthly records first were tabulated 15 to 20 years ago. During the month but 864,580 gross tons were made, which compared with the 1,064,007 tons of June, represents a loss of 199,427 tons. This decline was made in spite of the fact that July was a 31-day month compared with the 30-day month of June and may be attributed entirely to the net reduction of 16 working furnaces in June and five during July.

MONTHLY PRODUCTION

	1921	1920	1919
January	2,414,753	3,012,373	3,306,279
February	1,929,394	2,984,257	2,943,347
March	1,594,866	3,375,768	3,088,023
April	1,190,751	2,752,670	2,474,374
May	1,215,272	2,991,825	2,107 729
June	1,1,064,007	3,046,623	2,114,028
Total 1st half.	9,409,043	18,163,516	16,037,988
July	864,580	3,043,918	2,424,212
August		3,145,536	2,742,081
September		3,124,308	2,480,790
October		3,288,341	1,864,424
November		2,935,081	2,407,369
December		2,700,268	2,626,074
Total 2nd half		18,237,452	14,544,950
Grand total.	10,273,623	36,400,968	30,578,730

Stacks in blast, at the end of July, also set a new low record for operating capacity. During the month four furnaces were blown in while nine were blown out, thereby reducing the number from 74 on June 30 to 69 on July 31. Since Sept. 30, when 317 stacks were active, 248 have been blown out or banked.

AVERAGE DAILY PRODUCTION

	1921	1920	1919	1918	1917
Jan.	77,895	97,172	106,654	77,523	101,930
Feb.	68,906	102,904	105,270	82,794	94,641
Mar.	51,447	108,895	99,614	103,548	105,026
Apl.	39,691	91,754	82,479	109,112	110,936
May	39,202	96,510	67,991	111,351	110,119
June	35,466	101,553	70,467	110,538	108,675
July	27,890	98,190	78,200	109,954	107,659
Aug.	.....	101,468	88,453	108,983	104,483
Sept.	.....	104,143	82,692	113,774	104,691
Oct.	.....	106,075	60,142	112,335	106,332
Nov.	.....	97,836	80,244	111,595	106,620
Dec.	.....	87,105	84,711	110,602	93,077
Av.	48,460	99,456	83,910	105,290	104,502

Merchant iron production during July totaled 143,632 gross tons and showed a loss of 35,222 tons from the June level of 178,854. On an average daily basis this was at the rate of 4633 tons per day, a decrease of 1328 tons from the June average of 5961 tons per day. This represents a loss of 22.2 per cent from June. Nonmerchant or steelworks furnaces made 720,948 tons in June, which compared with the 885,153 tons of the previous month shows a loss of 164,205 tons. On a daily basis this output represented 23,256 tons per day in July which was lower than the June rate of 29,505 tons by 6249 tons per day. This loss was 21.1 per cent from the June average daily output. The total daily rate of production was 27,890 tons or 7576 tons per day less than the total of 35,466 tons during June.

Nonmerchant iron suffered greatest in the month's curtailment, for of the total decline in production of 199,427 tons, 164,205 tons was of this class. The balance of 35,222 tons loss was merchant iron. The nonmerchant output fell off 82.3 per cent and the merchant, 17.7 per cent. This ratio, however, is a result of the slump of June when the net loss in nonmerchant stacks was 12 as compared with four for the merchant class.

Of the merchant class, one furnace was blown in and five blown out in the month with a net loss of four furnaces. Of the nonmerchant class, three furnaces were blown in and four blown out, a net loss of one furnace. Of the total number of furnaces operating on the last day of the month, 14 were merchant and 55 were nonmerchant. The Steel corporation was operating 32 furnaces on July 31, the total being the same as for June.

DIVISIONS OF PRODUCTION

1920	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	716,574	2,267,747	5,903	18,054	4,095
Feb.	735,707	2,215,079	11,755	18,015	3,701
Mar.	863,167	2,474,018	15,472	19,203	3,908
Apl.	761,331	1,958,535	6,600	18,036	8,168
May	808,751	2,140,346	10,744	21,536	10,448
June	769,236	2,233,565	8,510	26,870	8,442
July	791,440	2,209,128	6,925	28,347	8,078
Aug.	823,495	2,276,433	8,333	28,642	8,633
Sept.	798,111	2,277,607	11,849	27,697	9,044
Oct.	818,166	2,430,656	9,000	25,786	4,733
Nov.	705,014	2,190,217	11,006	23,298	5,546
Dec.	586,466	2,076,693	4,587	28,112	4,410
Tot'l	9,177,458	26,750,024	110,684	283,596	79,206
1921					
Jan.	474,135	1,940,618	2,542	20,960	4,950
Feb.	338,383	1,591,011	11,566	17,447	4,067
Mar.	276,559	1,318,307	19,746	17,682	3,222
Apl.	238,539	952,212	14,744	13,266	3,163
May	215,703	999,569	2 379	6,853	4,553
June	178,845	885,153	....	4,536	6,090
July	143,632	720,948	4,015	1,509	6,283

Spiegeleisen produced in July totaled 4015 tons while in June none was made. Ferromanganese with 1509 tons showed a loss of 3027 tons.

Among the stacks blown in during the month were: In Ohio: Mary, Sharon Steel Hoop Co. In Pennsylvania: One Donora, American Steel & Wire Co.; one Monessen, Pittsburgh Steel Co.; and Robesonia, Robesonia Iron Co., Ltd.

Stacks blown out during July were: In Ohio: Globe, Globe Iron Co.; River No. 3, McKinney Steel Co. In Pennsylvania: Perry, Perry Iron Co.; Monessen, Pittsburgh Steel Co. In Virginia: Alleghany, Alleghany Ore & Iron Co. In Alabama: Etowah No. 2, Alabama Co.; one Ensley, Tennessee Coal, Iron & Railroad Co. In Indiana: South Chicago, Wisconsin Steel Co. In Wisconsin: Mayville B, Steel & Tube Co. of America.

JULY PIG IRON

	Number of stacks	Number in blast last day of month: July	June	—Total tonnage made— Merchant	Nonmerchant	—Totals— July	June
Pennsylvania	161	29	28	34,046	257,423	291,469	391,275
Ohio	79	13	14	14,732	157,731	172,463	223,380
Alabama	45	5	7	14,547	52,026	66,573	93,224
Virginia	19	1	2	3,628	.....	3,628	5,287
New York	28	3	3	22,083	12,324	34,407	34,241
New Jersey	4	1	1	5,554	.....	5,554	6,051
Illinois	26	5	6	15,266	77,990	93,256	107,329
Colorado	6	2	2				
Indiana	16	7	7	27,493	125,961	153,454	151,042
Maryland	6	1	1				
Wisconsin	6	0	1				
Kentucky	7	0	0				
West Virginia	5	1	1	.....	16,167	16,167	18,227
Tennessee	16	0	0				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	0	0	.....	15,802	15,802	23,325
Michigan	3	1	1				
Missouri	1	0	0				
Spiegel and ferro-all states	..	..	..	6,283	5,524	11,807	10,626
Totals	435	69	74	143,632	720,948	864,580	1,064,007

Rate Reduction

Asked But No Date Fixed For Conference—Shippers Join Move

Pittsburgh, Aug. 2.—So far as can be learned here, the request filed recently with George Ingalls, New York, for a conference looking toward the reduction of freight rates on iron ore, coke and limestone, has not been answered and consequently no date has been set. The consensus of opinion is delays will ensue and no freight rate reductions can be anticipated at least during this year, since the railroads are anxious to test out the present high rates during a time of good business. If a conference is granted, it probably will not take place for a few weeks due to the hot weather, vacation season, etc., although it is possible sufficient pressure may be brought to bear to hasten such an arrangement. Those who joined in the request for a conference include the American Steel & Wire Co., Jones & Laughlin Steel Co., Carnegie Steel Co., Republic Iron & Steel Co., Pittsburgh Steel Co., Crucible Steel Co., Cambria Steel Co., Weirton Steel Co., Youngstown Sheet & Tube Co., American Sheet & Tin Plate Co., Trumbull Steel Co., Clinton Iron & Steel Co., Trumbull-Cliffs Furnace Co., Sharon Steel Hoop Co., Brier Hill Steel Co., Mahoning Steel Corp., and National Tube Co.

Business interests of Ohio are making a demand today before the public utilities commission at Columbus, O., for a reduction in freight rates in that state on various commodities. Toledo, O., business organizations are uniting in asking for a reduction of 25 per cent in the cheaper grade of construction materials. Inquiry into rates on other commodities is expected to follow.

Suggestion Is Improved

Chicago, Aug. 2.—The railroads and shippers are apparently making rapid strides toward an independent agreement as to wage reductions. The suggested 20 per cent cut is meeting with wide approval. Informal meetings have been called in many of the industrial centers throughout the west to get an expression from both sides and reports indicate the 20 per cent figure is received with almost unanimous approval. This saving in wages now effective will more than offset the contemplated rate cut, it is held, even not figuring on any increased tonnage.

Chicago shippers feel this city is the logical headquarters for centralizing the effort toward securing lower rates and steps already have been taken to bring together many separate organizations in a single body. As yet no formal meetings have been called, but interest is at a high point and apparently only a definite program is needed. Railroad officials in most cases take a decidedly broad view of the situation and offer hearty co-operation. It is thought that by coming to an agreement independent of the interstate commerce commission, much time will be saved in the final adoption of new rates.

Labor Cut to 25 Cents; Third This Year

Pittsburgh, Aug. 2.—Effective Aug. 16, the common labor rate in the plants of the Cambria Steel Co. will be reduced to 25 cents an hour. This is the third reduction of common labor wages this year; from 45 to 37, 30, and now to 25 cents. Wages of other employes and piecework rate will be adjusted on a proportionate scale and salaries likewise will be reduced on an equitable base, according to Vice President L. R. Custer. While the company normally employs 18,000 workmen, only about 4500 are working now.

Claims Manganese Imports Needed for Defense

That manganese is the only raw material necessary for the production of steel; the reserves of which within our borders are entirely inadequate to meet requirements in case of war, is claimed in a report compiled by the raw materials department of the Midvale Steel & Ordnance Co., Philadelphia. The domestic reserves, it is said, cannot meet all or even a major part of the nation's requirements, although they can be substituted to some extent. If they could be used exclusively, the supply would be exhausted in six or seven years.

The report, which has been filed with the senatorial finance committee, includes several other arguments tending to show why the importation of high grade manganese ores and ferromanganese alloys should not be restricted. It is pointed out that the imported ores are essential in making war materials. "While inferior alloys made from domestic ores were used as a matter of necessity during the war," continues the report, "this was only done by sacrificing quality of product."

It also is claimed that as a rule domestic ores are in small deposits, widely scattered, to a considerable extent remote from railroads and at great distances from points of consumption.

Dawes Links Government Buying and Selling

Washington, Aug. 2.—Col. H. C. Smither has been made chief co-ordinator of general supply, which is the key position of the new purchasing and sales system being built up by Budget Director Dawes. Among the assistants already named to Colonel Smither are Lieut. Cols. John W. Wright, J. P. McAdams and J. C. Rhea, and Majors T. W. Hammond, D. A. Robinson, J. R. McAndrews and Max R. Wainer.

Directors Dawes' machinery for co-ordinating all federal purchasing and selling is, briefly, as follows: The country has been divided into nine areas, corresponding to the war department corps areas. In each of these will be a co-ordinator, to whom all branches of the government will send lists of surplus material and lists of requirements. At Washington each executive department and other government agencies will have co-ordinators.

The primary object of the system is to prevent one department from going into the open market and purchasing a stated commodity while another department is attempting to sell it. An elaborate plan for arriving at the fair market value for surplus material is being worked out, especially to provide for proper return to the department transferring its surplus supplies to another department.

At this time the Dawes plan has the result of slowing up markedly government purchasing, which may obtain until the war surplus of supplies has been worked off. After that there will be less interchange of supplies and an approach to normal buying in the open market. The navy is the largest government purchaser of steel, and buying has been slowed decidedly. The most radical departure is the cancellation of the schedule for a large tonnage of plates, shapes, sheets and bars on which the department was to open bids Friday.

The 80 tons of magnesite wanted for the South Charleston, W. Va., naval projectile plant have been awarded to the General Refractories Co., Philadelphia, at $49.95, delivered.

Designs New Furnaces

On page 1718 of the June 23 issue of THE IRON TRADE REVIEW the annealing equipment in the new sheet mill of the Milwaukee Rolling Mill Co. was said to have been furnished by the Hubbard Steel Foundry Co., East Chicago, Ind. This is incorrect, the annealing furnaces having been designed and supplied under contract by the George J. Hagan Co., Pittsburgh.

Believe Export Slump Temporary

Railway Requirements Are Said To Be Heavy Throughout the World—Numerous Inquiries Now in Market, but More Are Being Held Off Pending Price Readjustment—South America in Crisis

NEW YORK, Aug. 2.—With the exception of sales made to the Orient the export market has been stagnant during the past week. There is a large potential demand for railway material throughout the world but buyers apparently are in no hurry to place the business. The rapid decline in American prices is largely responsible for this situation, while export buying a few weeks ago appeared to be increasing, the foreign clients now believe that the lowest price level has not as yet been reached. Export buying, it is anticipated, will not begin again until the market in the United States becomes more stabilized.

Among the foreign railway requirements listed as current are 12,000 tons of rails needed by Chile, 3000 tons for Morocco, 1000 tons for Manila, 8000 tons for Finland and 12,000 tons for Bolivia. The Chilean inquiry includes not only rails, but switches and similar accessories.

W. R. Grace & Co. pointed out that a quotation recently received from Belgium for rails for Peruvian railroads was $15 a ton lower than the cheapest bid on American rails. The award was made to Belgium.

On a contract for 10,000 rolled steel car wheels for the Argentine government railways, the bids were: American $43.25 each, c.i.f. Buenos Aires; German, $37.50 each, c.i.f. Buenos Aires. On a contract for 10,000 tons of rails for the Chilean state railways, the bids were: American $57.50 per ton, c.i.f., Valparaiso; German, $42.50 per ton, c.i.f., Valparaiso. On an inquiry for flour milling machinery, German manufacturers quoted prices for machinery installed in Argentine 10 per cent lower than the American c.i.f. cost at Buenos Aires. On three diesel engines of 400 horsepower each the bids were: American $103,000 (United States gold,) c.i.f. Buenos Aires; German $70,000, c.i.f., Buenos Aires. On an inquiry for eleven motor-driven centrifugal pumps for Argentina bids were: American $62,810 (Argentine gold,) c.i.f. Buenos Aires; German, $26,965 (Argentine gold,) c.i.f., Buenos Aires. On 12 locomotive cranes for Argentine the bids were: British, 30,127 pesos, c.i.f., Buenos Aires; American, 28,600 pesos, c.i.f., Buenos Aires; German, 19,772 pesos, c.i.f., Buenos Aires.

John Barret, former ambassador to Argentina, declares that "it is the consensus of the best export opinion in the country that trade of the United States with Latin America is in the midst of the severest crisis that it has ever faced and heroic methods must be employed to prevent disaster alike to the financial, exporting and importing interests of North and South America."

"The trouble," said Mr. Barrett, "is the exchange situation, which is most unfavorable to Latin America and reacts on the United States. Today there are over $50,000,000 worth of American exports undelivered in the ports of several South American cities, and these must be disposed of before there can be any improvement. Naturally Germany, Great Britain, France, Spain, Belgium and Japan are taking advantage of this situation to the disadvantage of the United States."

One of the exceptions to the general rule was the contract, reported last week to have been taken by the Westinghouse Electric International Co., to supply the Midi railway of France with $1,200,000 worth of transformers condensers and lightning arresters.

Through British connections it is learned that Uruguay is asking for tenders, to be presented to local authorities before Aug. 18, for a steel petroleum tank, capacity 8000 to 8500 cubic metres; a Worthington duplex type steam pump for oil; and 250 metres steel tubing, required for the state electrical works, Montevideo.

Some definite developments in the Chinese railway contracts are expected next week when a delegate from China is expected to arrive in New York with details of the $3,000,000 undertaking that is to be handled by the Universal Steel Export Co.

A central union railway station, it is said, is to be built in Peking under the direction of the engineer-in-chief of the Peking-Hankow railway. Reported estimates for enterprises of the South Manchuria Railway Co. for the fiscal year 1921-1922 include the following items; Railway improvements, 13,920,000 yen; shipping, 1,180,000 yen; harbor works, 4,763,000 yen; mining equipment, 1,004,000 yen; industrial enterprises, 1,338,000 yen; iron and steel works, 1,555,000 yen; electricity and gas works, 2,485,000 yen.

An independent exporter reported the sale of 200 tons of black sheets to Japan last week. Japanese orders for sheets vary from 100 to 200 tons each. There is also a Japanese inquiry in the market for 1000 tons of structurals and plates. It is understood that this inquiry is based upon a government requirement. Another independent exporter last week sold 200 tons of rods to Japan.

Strike's Effect on British Foreign Trade

Birmingham, Eng., July 21.—The worst effects of the British coal strike culminated in June, the third month of the dispute, and the influence on the iron and steel trade is shown by the Board of Trade returns for the month. Iron and steel exports aggregated 64,701 tons, compared with 283,428 tons in June 1920, while the imports totaled 84,485 tons, as against 91,878 tons in June last year. The most striking figure in the returns relates to the import of coal. This totaled 1,390,824 tons. Not a ton was imported in June 1920.

The value of the exports of iron and steel and products thereof for June was £771,218, as compared with £11,521,907 in June, 1920. Imports of iron and steel were valued at £1,306,502, against £2,414,958.

In the first six months of the year the quantity of iron and steel exported was 871,949 tons against 1,652,688 tons in the first six months of 1920. The value, £38,150,482 against £57,707,485. The import totals for the same period were 735,803 tons, against 424,536 tons last year, and the values £13,875,589, compared with £9,728,830. Following were the principal iron and steel imports and exports:

IMPORTS

	Six months' tonnage 1920	1921
Pig iron, forge and foundry	12,145	143,807
Basic	85,209	61,619
Ferroalloys	8,817	1,761
Ingots, other than special steel	2,131	5,630
Blooms, billets, etc., iron	947	5,622
Blooms, billets, steel	111,161	86,593
Sheet and tin plate bars, steel	15,437	39,344
Wire rods	22,965	10,986
Steel, other descriptions	17,263	48,436
Castings, iron	1,280	6,962
Castings, steel	2,181	3,311
Steel girders, etc.	2,681	17,791
Hoops and strip	9,828	16,117
Plates and sheets	44,094	87,692
Steel rails	4,430	29,500
Wire	8,617	14,792
Wire nails	16,721	15,188

EXPORTS

Pig iron	360,292	77,786
Blooms, billets, etc.	5,157	651
Bars, rods, angles, etc.	28,742	17,311
Steel girders, etc.	38,773	23,933
Hoops and strip	24,829	9,775
Plates and sheets, over ⅛-inch	92,582	95,114
Plates and sheets, under ⅛-inch	78,798	25,246
Galvanized sheets	223,639	59,097
Tinned plates	180,886	106,234
Steel rails	515,553	85,472

British Steel Furnaces Starting

Blast Furnaces Lag Behind as Deadlock with Coremakers Continues—Minimum of $8 Offered on Coke—Belgian Mills Likely To Take 40,000 Tons of Rails for Home Roads — French Planning Great Buying Organization

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$3.60

LONDON, Aug. 1.—Seven British blast furnaces are now operating, an increase of one in a week. Twenty steel furnaces have been started in Sheffield, taking advantage of the low price of scrap. Orders generally are scarce. Belgian railways are inquiring for 40,000 tons of rails, but it is probable that the home mills will receive the business.

The Ebbw Vale Iron & Steel Co., is reopening its collieries on terms named by the company, after a dispute lasting 20 weeks. The company is operating its steelworks on a partial basis.

The deadlock between the pig iron manufacturers and coke producers over the price of fuel continues. A conference of smelters and cokemakers evolved a quotation of £2 5s ($8), which is considered by the former as being too high. Slack coal is becoming more plentiful and this is expected to bring lower coke prices by autumn.

Belgian basic pig iron is quoted at £5 ($18), and foundry iron £6 ($21.60), delivered, British ports. Belgian industry is stagnant, and more works are closing as demand continues low.

Twenty per cent of the tin plate works in South Wales are now operating. Tubes have been reduced 7½ per cent. Scotch foundry is sold out.

A great French buying organization is planned to place iron and steel products in the colonial and Far Eastern markets.

The Board of Trade reports that average export prices in June were as follows: Foundry iron £7 11s ($27.18); ferromanganese £17 3s ($61.74); plates £34 10s ($124.29); galvanized sheets £28 15s ($103.50) and tin plate £33 ($118.80).

Little Demand for Pig Iron; Furnaces Still Idle

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$3.50

BIRMINGHAM, Eng., July 22.—There is a kind of top-heaviness about the British iron and steel industry owing to the fact that while iron and steel works are restarting, the production of pig iron has not been resumed. The only district showing any activity is the northeast coast, where certain large steelworks require pig iron for daily consumption. The Midlands, the west coast and South Wales have done nothing whatever in the way of a restart. It is significant that in Cleveland, two of the furnaces relighted, capable of an output of 3000 tons per week, are using foreign ore because it is said local ore is too expensive. The mine owners' and miners' representatives held a meeting on Monday and the men were offered work on condition that they accept a substantial reduction. A short time ago their wages were reduced 5 shillings ($0.89) per day.

Coke prices have eased a little. On the northeast coast sellers are willing to deliver the fuel to the works at £2 5s ($8.05) per ton, the price recently demanded at the ovens. The demand for pig iron is not pressing enough to affect prices, although it is clear that the engineering concerns must soon be in the market for raw material for their foundries. Foundry requirements account for the starting of a furnace by Newton, Chambers & Co., which is at Thorncliff, Yorkshire.

With the steel trade practically paralyzed by high costs of production, which leaves continental competitors free to carry off all the business available, the demand for pig iron is so small as to be negligible. Forge pig iron is a drug in the market. The keen competition of Belgium and the news of severe cuts in America convey warnings to British makers which cannot be ignored. Hematite pig iron for steelmaking also is a subject of keen competition, and finds little demand. A peculiar feature of this department is that steelmaking iron is offered to foreign buyers at £7 ($25.06) f.o.b., whereas the British buyer is quoted £8 ($28.64).

Belgian billets are quoted this week at £7 12s ($27.21), delivered, as against £10 ($35.80) from South Wales. The rerolling firms using cheap foreign billets now practically command the general miscellaneous business in steel bars. Values of steel skelp are steadily being reduced and the ability to buy this material at from £12 ($42.96) to £13 ($46.54) has been a boom to tubemakers who find no small difficulty in holding their international business. Continental steel bars, however, can be bought here at £10 15s ($38.48) and joist and angles are something like £3 ($10.74) below the home figure.

In the iron trade business is only possible in best iron. This is obtainable at £20 ($71.60), a reduction of no less than £13 10s ($48.33) since the beginning of the year. The market bar houses have all orders on their books enabling the forges to start, but the hot weather has been discouraging. At one works last week four full shifts were lost solely as the result of the tropical heat.

Several ironmasters cite quotations of £1 18s per ton for coal, as against £1 14s before the strike. Only in one direction is there some sign of relief. For example, an ironmaster has prevailed on his coal vendor to divide his supplies into coal and slack. This concession was universally refused until lately, the coal being sent out with all sorts of fine material which reduced the heating value of the fuel. The buyer now gets his coal at £1 17s ($6.62) and his slack at £1 7s ($4.83).

The tin plate trade shows little signs of progress. A few mills have been restarted, but with coal at its present price the tin plate mills cannot produce at a profit especially as Welsh tin bars still are officially quoted at £10 10s ($37.59), although they can be bought from unassociated houses at £10

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

SEMIFINISHED STEEL

	$	£ s d
Billets, soft steel	34.20	9 10 0
Sheet bars	34.20	9 0 0
Wire rods	47.30	13 5 0

FINISHED STEEL

Steel bars, England, ¾ to 3-inch	45.00	12 10 0
Ship, bridge and tank plates, England	53.55	15 0 0
Ship, bridge and tank plates, Scotland	53.55	15 0 0
Beams, England	51.77	14 10 0
Beams, Scotland	51.77	14 10 0
Sheets, black, 24 gage	64.26	18 0 0
Sheets, galvanized, 24 gage	82.80	23 0 0
Rails, 60-lbs. and over	49.98	14 0 0
Tin plate, base box, 108 lbs.	4.64	1 6 0
Steel hoops	53.55	15 0 0

PIG IRON*

Hematite, West Coast, Mixed Numbers	28.56	8 0 0
Hematite, East Coast Mixed Numbers	27.90	7 15 0
Middlesbrough Basic	21.42	6 0 0
Middlesbrough, No. 3	24.99	7 0 0
No. 3 Foundry, Derby, Leicester, Nottingham	33.03	9 0 0
No. 3 Foundry, Northamptonshire	†	†
No. 3 Foundry, Staffordshire	30.35	8 10 0
No. 3 Scotch Foundry	31.69	8 17 6
Ferromanganese 76 to 80 per cent	64.26	18 0 0

COKE

Yorkshire furnace	9.82	2 15 0
Yorkshire foundry	13.39	3 15 0

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiations.
†Stocks sold out.

French Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	33.58	425
Basic-bessemer, Lorraine	17.78	225
Foundry, Longwy, No. 3, sand-cast	15.41	195
Foundry, Longwy, No. 3, chill-cast	16.59	210
Foundry, Longwy, No. 2, sand-cast	16.99	215
Foundry, Longwy, No. 2, chill-cast	18.96	240
Ferromanganese, 76 to 80 per cent	75.05	950

COKE

French furnace	8.69	110
German, Belgian and British furnace	8.69	110
French foundry	11.46	145

SEMIFINISHED STEEL

Blooms	23.70	300
Billets	25.28	300
Sheet bars	25.28	300

FINISHED MATERIAL

Standard rails	35.55	450
Merchant bars	30.02 to 33.18	380 to 420
Angles	33.97	430
Normal beams and profiles	33.18	420
Plates, ship and tank, 10 millimeters and thicker	49.38	625
Plates, bridge and tank, 5 to 10 millimeters	55.30	700
Sheets, black, 3 millimeters	60.56	740
Sheets, blue annealed, 2 millimeters	70.31	890
Shafting, cold-drawn, 40 to 60 millimeters	59.25	750
Bars, 2 per cent nickel steel	94.80	1200

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported.

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic-bessemer, Belgian	14.82	195
Basic open-hearth, Belgian	13.30	175
Gray forge, Belgian	16.34	215
Foundry, No. 3, Belgian	15.20	200
Foundry, No. 3, Luxemburg	13.68	180
Foundry, No. 3, Lorraine	13.68	180

SEMIFINISHED STEEL

Blooms	23.18	305
Billets	24.32	320
Sheet bars	25.84	340
Wire rods	32.68	430

FINISHED MATERIAL

Standard rails	34.20	450
Merchant bars	28.88	380
Normal beams and profiles	29.64	390
Plates, 5 millimeters and thicker	34.96	460
Sheets, black, 3 millimeters	38.00	500
Sheets, galvanized, 1 millimeter	106.40	14.00
Plain wire	34.20	450
Galvanized wire	64.60	850
Wire nails	34.20	450

All prices are f.o.b. furnace or works.

($35.80). While foreign bars can be bought much cheaper, the maker of tin plates naturally does not desire to rebuild his business on foreign material, while the buyer from long experience, prefers Welsh steel.

Galvanized sheets are a shade stronger at £24 ($85.92). The mills in the Midlands have been idle for many months but their owners now are booking orders for August delivery on a small scale.

Wales Resuming Production of Sheets

European Special Correspondence

CARDIFF, South Wales, July 21.—Conditions in South Wales steel and tin plate trades remain quiet. Coal is gradually coming along to the various works, but there is a lack of orders, so that only about 15 per cent of the tin plate mills are operating.

No sustained revival in the industry is looked for this year, and at the moment the future price of coal and steel, particularly the former, is engaging the attention of tin plate makers. It is regarded as questionable whether coal at £1 10s will enable steel and tin plate makers to produce at a profit in view of foreign competition. The fact that

Sterling—$3.63

per cent of the South Wales tin plate works are associated with the Welsh steel bar trade militates against the use of foreign bars so that it is argued that Welsh steel must come down in price if tin plate is to be cheaper, or produced at a profit.

Japan is in the market for charcoal plates, and home consumers want odd sizes, but prices quoted do not agree with sellers' views. Quotations still are around £1 7s 6d ($4.89) basis f.o.b. Swansea for early delivery. Forward prices are easier at £1 4s to £1 4s 6d ($4.35 to $4.44) per box, as against £1 5s ($4.53) a week ago. Ternes are somewhat active, especially the heavy gages, but the price remains around £1 6s ($4.71) basis I. C. f.o.b. Swansea.

Current prices are as follows: Cokes, 20 x 14, £1 4s 6d to £1 8s ($4.44 to $5.07); cokes, quarters, £1 6s 6d to £1 8s ($4.80 to $5.07); cokes, 20 x 10, £1 17s 6d to £2 ($6.78 to $7.26); cokes, 28 x 20, £2 9s to £2 16s; ($8.88 to $10.14); ternes, 28 x 20, £2 10s to £2 13s ($9.06 to $9.60).

Welsh tin and sheet bars are again at £10 10s ($38.10) with the prospect of the official minimum being lowered

still further at an early date. Until the Welsh sheet and tin plate trade shows a substantial improvement the bar trade will continue to be slow. At present most of the steel works remain idle.

Preparations are being made for restarting some of the sheet mills as the market is presenting a better appearance. Inquiries for sheets from overseas are current, and with reasonable fuel prices it is expected substantial business will soon be in evidence in the galvanized sheet trade. For 24 gage corrugated, in bundles £22 10s to £23 10s ($81.76 to $85.39) f.o.b., is quoted. Flats are £1 ($3.63) higher than these rates. The Far East is in the market for thin gages, but business is slow.

English zinc sheets are slow at £36 to £37 ($130.68 to $134.31). Nickel is unchanged at £190 ($689.70) for both home and export.

The scrap market is unchanged, but taken generally it has a considerably firmer undertone.

Belgian Prices Cut; 7 Furnaces in Blast

European Staff Correspondence

BRUSSELS, July 21.—Lorraine and Luxemburg foundry pig iron is nominally quoted in Belgium at 20 francs ($1.52) less than the home product. Wire rods have dropped 10 francs ($0.76) to 430 francs ($32.68) per ton. Merchant bars have been reduced 20 francs ($1.50) heavy plates, 30 francs ($2.28); sheets, 10 francs ($0.76) and plain wire 20 francs ($1.52.

Franc—$0.076

Lorraine and Saar semifinished products are setting the pace in the Belgian home market, while Belgium itself is seeking export outlets. Merchant bars for export are offered f.o.b. Antwerp, at 390 francs ($29.64), rods at 430 francs ($32.68) and beams and profiles at 400 francs, ($30.40). All of these figures are in excess of home delivery prices.

The Chinese government is asking for bids on 36 locomotives and 240 freight cars from Belgian makers, and the contract is supposedly on the eve of being signed. Workers in the Charleroi district have agreed to accept another wage decrease.

The situation in the Grand Duchy of Luxemburg is hardly better than in Belgium. Differdange has suspended all production since July 15. Production costs as compared with market quotations have compelled this move. Advantage will be taken of the shutdown to modernize the plant with a view to more efficient production.

French Quotations Again Are Reduced

European Staff Correspondence

PARIS, July 21.—Prices of pig iron, merchant bars, normal profiles, blue annealed sheets and 2 per cent nickel-steel have dropped during the past week. Foreign competition, more than a home demand, was the principal cause for the reductions. There is a lack of activity on all sides.

Revision of customs tariff and wage scales are expected to work magic. The former has been greatly increased in respect to iron and steel products. Wages have been reduced 8 to 20 per cent in various important producing districts. The low rate of exchange for the mark, the lower

Franc—$0.079

wage scale, and the longer hours of work in Belgium and Germany are considered highly favorable to those countries.

It is estimated that not more than a third of the blast furnaces of France are in operation. Second fusion operators still are complaining that coke is too high. Pig iron prices vary 10 to 30 francs ($0.79 to $2.37) from quotations generally given, both up and down the scale. Stability is lacking.

A new preferential customs tariff is on the eve of being consummated between France and Belgium, which so far as iron and steel products are concerned, is likely to work about the way the Belgium-Luxemburg agreement has worked, altogether to the disadvantage of Belgium. Already Belgian francs have fallen below the value of French francs.

The French business turnover tax, first estimated to produce 415,655,500 francs per month, and later revised to 241,666,500 francs, actually produced in June but 146,500,000 francs. Customs receipts fell 36 per cent below budget estimates and were 33 per cent less than in the same month in 1920.

Germans Buying; Taxes To Raise Prices

European Special Correspondence

DUSSELDORF, Germany, July 21.—A slight revival of activity particularly on the part of German consumers is shown. Export trade continues in an unsatisfactory condition. German buyers are influenced somewhat by the prospect of higher prices in the autumn as a result of the increased

Mark—$0.013

taxation which is coming into force. It is now understood that the coal tax will be increased from 20 to 50 per cent ad valorem. At present steam coal is selling for 300 marks ($3.90) per ton, of which 60 marks ($0.78) represents taxes. But from Oct. 1, the fuel tax will be 50 per cent, or 150 marks ($1.95) per ton, on the basis of present values for coal. Under these circumstances it is not seen at present how coal can be sold after Oct. 1 for less than 400 marks ($5.20) per ton.

Since wages cannot be reduced at present it is expected that the iron and steel producers will be compelled to increase their prices in the autumn in proportion to the new fuel prices.

Iron ore is weak and the domestic mines are having a hard struggle against the competition of Spanish and north African ores. Best washed santander is now being offered freely at 24 shillings ($4.33) per ton c.i.f. Rotterdam, on a basis of 50 per cent, iron natural. Best Bilbao Rubio is quoted at only 28 shillings ($5.50) c.i.f. Rotterdam, on the same. Prices f.o.b. makers works follow:

	Marks per metric ton	Dollar equivalents
Ingots	1350	$17.55
Rolled blooms	1400	18.20
Billets	1500	19.50
Slabs	1600	20.80
Bars	1800	23.40
Bands	2000	26.00
Beams	1800	23.40
Ship plates	1750	22.75
Boiler plates	2300	29.90
Tank plates, 3 to 5 millimeters	1800	23.40
Sheets, under 3 millimeters	1900	24.75
Plain wire	1850	24.10
Galvanized wire	2950	38.30
Screw and bolt stock	2700	35.10
Nails	2700	35.10

Cast Iron Pipe Output Is 37 Per Cent Less

In 1919 the total output of cast iron pipe and fittings was 702,550 tons which is 37.3 per cent less than the 1914 tonnage of 1,120,720 tons according to a report issued by the census bureau. The value however increased 86.7 per cent during this period to $51,902,800. The decrease is found in gas and water pipe and fittings and chiefly in pipe of the bell and spigot type. The output of this latter class was 375,200 tons in 1919 against 828,900 tons in 1914 a decrease of 54.7 per cent. Production of soil and plumbers' pipe and fittings increased from 211,650 tons in 1914 to 254,670 tons in 1919. Flange pipe dropped from 27,290 tons in 1914 to 23,790 tons in 1919. A falling off is noticeable also with culvert pipe, of which 11,010 tons were produced in 1914 and 5660 tons in 1919. Fittings gained from 41,870 tons in 1914 to 43,230 tons in 1919. Production of all other castings reached a total of 254,670 tons in 1919 a perceptible gain over 1914 with 211,650 tons. Complete statistics in net tons follow:

Kind	1919	1914
Cast iron pipe and fittings	702,550	1,120,720
Gas and water pipe and fittings	447,880	909,070
Bell and spigot pipe	375,200	828,900
Flanged pipe	23,790	27,290
Culvert pipe	5,660	11,010
Fittings	43,230	41,870
Soil and plumbers pipe and fittings	254,670	211,650
All other castings	16,400	13,580

Figures were based upon 59 establishments engaged in the manufacture of cast iron pipe and products and seven establishments in 1919 and nine in 1914 in other lines of manufacture.

Pacific Coast

Prices Are Marked Down—Foundries Receive More Inquiries

San Francisco, July 30.—Business continues quiet in the local market for iron and steel products. Prices lack stability and keen competition has resulted in further shading of the prices announced July 6.

Sales of pig iron in this district during the past few weeks did not total much over 500 tons. Foundries report a slightly better volume of inquiries for castings and engine makers have booked several good jobs. The only sale of basic pig iron reported this week was one lot of 100 tons for an interest in the southern part of the state. An inquiry has been received from a toolmaker for 500 tons of basic. The government will open bids on Aug. 12 for 150 tons of foundry iron for the Puget Sound navy yard. The coke market is practically at a standstill. The navy purchasing office will open bids on Aug. 8 for 400 tons of foundry coke for Mare island, although it is understood the material will be shipped to the Philippine islands.

Demand for merchant and reinforcing bars is slack. All three of the local mills are down this week. It is reported that the United States Steel Products Co. secured an order for 250 tons of merchant bars for an interest in the Philippine islands and at a price slightly lower than 1.75c, base Pittsburgh. W. S. Wetenhall Co. secured a contract for 110 tons of reinforcing bars for three bridges.

Prices of all grades of sheets declined radically during the past week. No. 28 galvanized sheets are generally quoted at 4.00c, black sheets at 3.00c and blue annealed at 2.40c. A jobbing interest in the southern part of the state has closed for 300 tons of galvanized sheets at 4.00c, base Pittsburgh. A license-plate maker is inquiring for approximately 250 tons of cold-pickled sheets.

Little new business has come out in the local structural market during the past week. The Austin Co. has been awarded the contract for a factory building for the Angelus Sanitary Can Machine Co. to be erected in San Francisco. An inquiry has been received from the Llwellyn Iron Works, Los Angeles, for 300 tons of shapes. A local fabricator placed an order for a carload of Belgian shapes at 2.12½c, delivered San Francisco.

With prices of cast iron pipe ranging appreciably lower and makers shading to obtain business, inquiry is relatively small and not much tonnage is being booked. The American Cast Iron Pipe Co. was awarded the contract for furnishing the Los Angeles department of public service 329 tons of 24-inch pipe.

Note Improvement

In Wholesale Jobbing Trade in Seattle —Foreign Inquiries Increase

Seattle, July 30. — Unsettled prices and uncertainty as to freight readjustments continue to worry steel and iron consumers, in consequence of which buying has been reduced to the minimum and mill representatives are marking time. Jobbers are either purchasing in limited lots at spot prices, or are replenishing their stocks by trading among each other. All stocks are extremely low. One house which ordinarily carries 1200 tons now has less than 200 tons. The trade feels that it cannot afford to purchase in volume in a declining market and with the prospect of a $12 freight reduction.

Exporters state that conditions are more hopeful, considering the increased number of inquiries from various foreign markets. The inquiries are for sheets, pipe, rails and nails, principally, and they come from Japan and China. One house had an inquiry from Java, Another firm has quoted prices on two lots of steel rails, 1000 tons each, for Japan and the Philippines. One local firm is quoting on a shipment of approximately 450 tons of steel bars for the Hawaiian Islands.

No change is noted in pig iron and coke, demand for both being extremely limited. Attractive prices have failed to stimulate interest in pig iron, as the foundries are running at a reduced rate. Agents of American pig iron manufacturers are unable to compete in this market because of high freight rates, although regular steamship service from Gulf ports may give southern makers entry into this territory. Belgian pig iron, silicon, 3½ per cent, is offered here at $37.50, at which figure American mills cannot compete.

Dealers in resale material report business somewhat improved. Some resale steel is being moved to California, this trade being aided by the resumption of steamship service. There is also a better mevement of secondhand machinery, although large stocks of shipyard equipment are offered at low prices. As an instance, Osgood-Marion 6-ton locomotive cranes are being offered for $4000, and a 600-pound Erie steam hammer, at $1000.

Announcement is made that the Washington Sales Engineering Co. has received the award for steel to be used in the construction of five bridges in Alaska.

End Hearings on Valuation Plan

Senate Finance Committee To Begin Executive Sessions at Once—Flood of Witnesses Seek Chance To Testify on Rates—House Committee Now Questioning Secretary Mellon on Tax Measure—May Speed Action on Bill

WASHINGTON, Aug. 2.—Hearings upon the American valuation provisions of the Fordney tariff bill were concluded today by the senate finance committee. Beginning tomorrow, the committee will consider this departure in tariff-making in executive session, and upon the committee's decision hinges the fate of the bill as it came from the house. If the committee votes to throw out the valuation proposal, practically every ad valorem rate in the bill will be revised. If the proposal is accepted, the modifications will be decidedly fewer. Nothing is more hazardous to indicate than the possible action of either house upon tariff and tax revision, but there is no question of the marked hostility of Chairman Penrose and other members of the senate committee to the measure as it is now written.

May Eliminate Excess Tax

The finance committee's program is a week behind. Except for several witnesses asking restoration of the dyestuffs embargo, no testimony has been taken concerning rates. A decision on the valuation proposal is not looked for before Thursday at the earliest, and it may be next week before a schedule for witnesses on the various schedules of the Fordney bill will be prepared. Some 268 requests to be heard are now before Chairman Penrose and the number grows daily. It is said more than two score requests concern the metals schedule, and some testimony concerning the ferromanganese, magnesite, aluminum, zinc and lead rates may be expected.

Meanwhile the house ways and means committee has concluded its open hearings on tax revision and is devoting the first part of this week to executive conference with Secretary Mellon and the treasury experts. Out of these hearings will come the new revenue bill, but as is the case with the tariff, the house is expected to do only the preliminary work and leave the heaviest part of the task to the senate finance committee. Criticism has been heard on the reported program of the ways and means committee in that it contemplates only a shifting of the tax burden and not a reduction. The bill to be reported by the committee will put the country's 1922 tax bill at something like $3,500,000,000 as against the $4,000,000,000 minimum urged by the treasury.

It appears today as definitely as possible that the excess profits tax will be eliminated, and that the higher brackets of the income tax will be wiped out. A group in the house will insist if the higher income tax rates are reduced, the normal rate must be reduced from 4 to 3 per cent or the exemptions increased proportionately. Three-cent first class postage seems dead. If the 3 per cent tax upon freight charges and 8 per cent upon passenger fares are not wholly eliminated they will be halved for the coming year and terminated the second.

Index Is Ready

THE index to Volume LXVIII, of THE IRON TRADE REVIEW, *covering the first six months of* 1921, *now is ready for distribution. Copies will be sent to all subscribers who express their desire for them.*

Chairman Fordney of the ways and means committee is authority for the statement it will take at least three weeks to draft the revenue bill. At the same time the house plans to receive the revenue bill about Aug. 20, pass it and adjourn before Sept. 1. The President appears anxious to have the house pass the revenue bill at the earliest moment and then recess for four to six weeks.

Admittedly, self-interest has prompted most of the witnesses appearing before the ways and means committee and seeking amelioration of the tax assessment of their various industries. The committee is inclined to agree with witnesses as to the necessity for moderating certain of the taxes, but cannot find other sources of equal supply. William H. Stackhouse, Springfield, O., president of the National Implement and Vehicle association, has urged the committee to strike the shackles off industry by refunding all Liberty bond issues until 50 years hence, and retiring them over a 25-year period. All existing excise taxes and also the transportation taxes should be repealed, Mr. Stackhouse urged.

Shows Tax Injustice

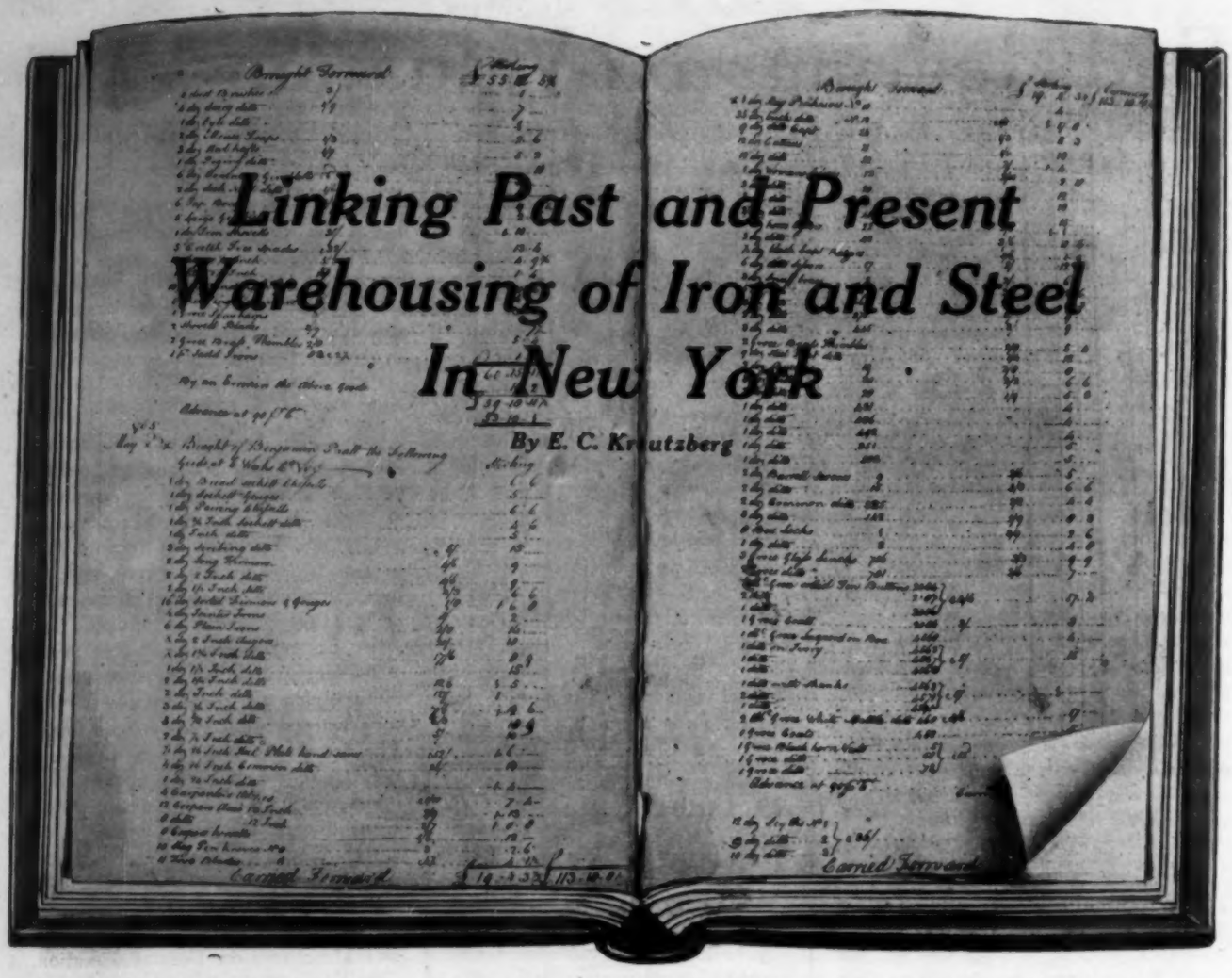
James E. Emery, of Washington, speaking for the National Association of Manufacturers, has given arguments in favor of the repeal of the excess profits tax, reduction of income taxes to a maximum of 35 per cent, repeal of the war excise taxes and touched upon the association's preference for a sales or turnover tax. Mr. Emery went deeply into the injustices worked by applying to corporations in peace time rates designed for a war footing. The net corporate return of business in the United States "as measured by its capacity to buy has declined backward toward the point where it very closely approaches the buying power that it had before the outbreak of the European war," said Mr. Emery.

The Committee of Manufacturers and Merchants on Federal Taxation, a recent organization with headquarters at Chicago, has urged four bills by Representative Oscar E. Keller, of Wisconsin. The feature of the Keller program is a tax on land values, placed tentatively at 1 per cent on all land values in excess of $10,000 after deducting improvements. The Keller program also calls for repeal of the transportation, excess profits and corporation income taxes. The shipping board has asked for what is equivalent to a 10 per cent additional levy on all imports not brought into port in American bottoms.

Some opposition is piling up against the Winslow and Townsend railroad relief bills in the house and senate, respectively. Passage of either bill is requisite to a settlement of railroad and government claims growing out of the period of control. Funds are available to pay the $500,000,000 to the carriers but before this is done the administration desires the War Finance corporation to take over several hundred million in railroad bonds as payment for maintenance and other capital account expenditure during the control period.

Linking Past and Present Warehousing of Iron and Steel In New York

By E. C. Krautzberg



Earliest purchases of Abeel & Byvanck, in March and May, 1765, which shows typical items carried by an iron merchant in those days

A BIRTHDAY which is unique in the history of the iron and steel business in this country is the one hundred and fifty-fifth anniversary of the founding of the iron and steel jobbing firm, Abeel Bros., New York. Established in 1765 by Garret Abeel, with his brother-in-law, Evart Byvanck, the business has been handed down from father to son and an Abeel always has been at the head With but three exceptions, all persons interested in the business have been bearers of the Abeel family name.

The only break in the continued conduct of the business was during the revolutionary war. Hanging in the office of Abeel Bros., is a well-preserved document in which Governor Tryon of the "province" of New York appointed Garret Abeel "Captain of that Company of Foot of which David Abeel was Captain." David Abeel was the father of Garret. Next to this document hangs another which represents the appointment of Garret Abeel, by the "Provincial Congress for the Colony of New York, as First Major of the Second Regiment of Militia of Foot of the City of New York of which John Hay is Colonel." When Garret Abeel thus left the English militia to join the revolutionary army, his business was broken up and a price put on his head. He removed his papers to a barn in New Jersey for safety, but this barn was destroyed by the British and most of the records were lost. Those that remained still are carefully preserved. Although these books have become dust-covered and stained through disuse they were written at a time when hand-writing still was an art and a perusal of them affords a clear impression of the character of the business as it was conducted in those days. Two of the documents have been reproduced in this article and assist in giving an idea of early business periods.

Iron and steel jobbing in 1765 differed considerably from the business of today. Then the jobber was an "ironmonger," and the iron business included hardware; it resembled that of the present general store. Practically all the goods sold were obtained from England, since manufacturing was of negligible proportions on this side of the Atlantic at that time. The first entry in the ledger of Garret Abeel is dated March 26, 1765, and contains a bill of goods which the company bought from Joseph and John Marschalk. Some of these items are the same as figure in the commerce of today, while others have disappeared in the march of time. The list included "locks, bellows, coffee mills, gridirons, scales, chaffing dishes, knives, coopers' broadaxes, marking irons, paper inch potts, hand saws, iron plates, steel plate, bits, nails, screws, candle sticks, pepper boxes, steel plate hand saws, etc." Iron and steel figured more extensively in later transactions. An item under date of May 11, the same year, records the purchase from "Father Evert Byvanck" of "91 bars Swæeds iron." An entry under date of May 30 shows a purchase of "English steel" and another on May

31, a purchase of "refined iron." A receipt is reproduced on page 288 inserted on one of the record books, which acknowledges delivery of a quantity of "refined iron" bought Dec. 19, 1768.

Prices now and when the company was founded, while not directly comparable, in a general way have a common basis. The refined bar iron mentioned sold for £29 3s 10d for 21 hundredweight, two quarters and 14 pounds. Converted to measures of currency in this country and computed at the present rate of exchange between the United States and England the buyer received his iron for approximately $5.39 per 100 pounds. Other prices were: One bar of English iron, $1.52; 1 bar of Swedes iron, $2.27; 1 bundle spring steel, $9.15; 1 bundle band iron, $1.60.

Other items which appeared in the records of that year were clocks, anvils, chains, and general hardware. In addition, the firm engaged in what was known as "adventures." In August, 1765, for instance, it shipped 25 tons of "pig mettle" to England under the heading "Adventure to Bristol." This evidently was an unprofitable undertaking as there was a charge of £69 1s 4d to profit and loss in connection with the shipment. Interesting developments were made among the different lines along which these old ironmonger houses operated in the course of the years. Some of them, like the Abeel company, abandoned hardware as time went on and specialized in iron and steel. Others gave up iron and steel jobbing and concentrated on hardware. Still others centered their efforts on the ship chandlery business. One of the most interesting records of the Abeel company is an original contract or form of indenture which was used for apprentices. The document, which is reproduced on page 287, gives a good idea of the importance then attached to the painstaking learning of trades in the early days. The apprentice Nickolas Van Antwerp, with the consent of his father, agreed to serve his masters, Garret Abeel and Evart Byvanc, during a period of six years and in that time to give practically all of his time to their interests. In return the masters agreed to endeavor to teach the young man in the "mistery of merchandize," but further stipulated that if the apprentice "behave himself well" they would give him a complete suit of good broadcloth, a beaver hat, two pairs of stockings and a pair of shoes.

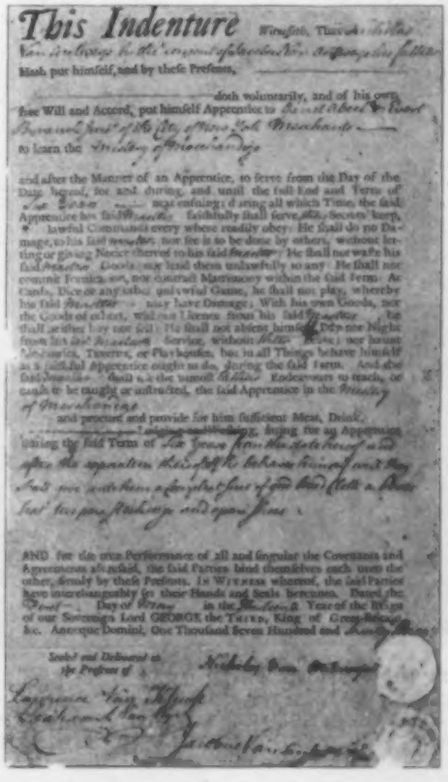
Considering the practice of the twentieth century, when the apprentice is almost extinct, the conditions under which a trade was learned in the eighteenth century were most exacting. Perhaps the long term of apprenticeship with the intimate association of the apprentice with his masters, encouraged earnest work and faithful service. At any rate it was the apprentices of the colonial days who later became the merchants and mechanics of New England, New York and Pennsylvania, and whose early accomplishments marked the first step in the development of the United States as a great industrial nation. Garret Byvanck Abeel, son of Garret Abeel, resumed the business in 1791 and the company still has an order for hardware which he sent to Eng-

Spans History of Steel in America

WHEN an American business establishment is able to count off years of its continuous existence in figures of three digits, it usually is in a position to point out steps in the growth of the organization which parallel or correspond with the outstanding events in the industry with which the business is identified. This is true in the case of the warehousing business carried on by the Abeel family since 1765. In this year cannon balls were first made in America, and in the following year the first patents for the puddling furnace were taken out by two Englishmen. James Watt's inventions were attracting attention at this time. Thus the company witnessed the development of the steam engine, the advance in ordnance and munitions, and practically the entire growth of the iron and steel industry in the United States.

Apprentices Were Earnest Workers in 1773

CRAFTSMEN a century ago were developed by a form of servitude with a skilled workman. They were bound to work together by a signed agreement, known as an indenture, such as pictured here. The substance of the text follows: During a term of six years, all of which time the said apprentice his said masters faithfully shall serve, their secrets keep, and lawful commands everywhere obey; he shall do no damage to his said master nor see it to be done by others, without giving notice thereof to his said masters; he shall not waste his masters goods, nor lend them unlawfully; and furthermore he shall not commit matrimony within the said term; at cards, dice or any other unlawful game, he shall not play whereby his said masters may have damage; with his own goods nor the goods of others, without license from his said master, he shall neither buy nor sell; he shall not absent himself day or night from his said masters' service without leave; nor haunt ale-houses, taverns, or playhouses, but in all things behave himself as a faithful apprentice ought to do, during the said Term. And the said masters shall use the utmost of their endeavors to teach or cause to be instructed, the said apprentice in the "mistery of merchandise" and procure for him sufficient meat and drink, fitting for an apprentice and after the expiration of the term, if he behaves himself well they shall give unto him a complete suit of good broadcloth, a beaver hat, two "pare stockings and a pare shoes."


This Indenture

Witnesseth, That

Nicholas, put himself, and by these Presents,

doth voluntarily, and of his own free Will and Accord, put himself Apprentice to

to learn the Mistery of Merchandize

and after the Manner of an Apprentice, to serve from the Day of the Date hereof, for and during, and until the full End and Term of

next ensuing; during all which Time, the said Apprentice his said Master faithfully shall serve, his Secrets keep, lawful Commands every where readily obey. He shall do no Damage, to his said Master, nor see it to be done by others, without letting or giving Notice thereof to his said Master. He shall not waste his said Master's Goods, nor lend them unlawfully to any. He shall not commit Fornication, nor contract Matrimony within the said Term. At Cards, Dice or any other unlawful Game, he shall not play, whereby his said Master may have Damage. With his own Goods, nor the Goods of others, without License from his said Master, he shall neither buy nor sell. He shall not absent himself Day nor Night from his said Master's Service, without his Leave, nor haunt Ale-houses, Taverns, or Playhouses, but in all Things behave himself as a faithful Apprentice ought to do, during the said Term. And the said Master shall use the utmost Endeavours to teach, or cause to be taught or instructed, the said Apprentice in the Mistery of Merchandize

and procure and provide for him sufficient Meat, Drink,

Lodging and Washing, fitting for an Apprentice during the said Term of from the Date hereof and after the expiration thereof he shall behave himself as such Apprentice ought to do, he the said Master shall give unto him

AND for the true Performance of all and singular the Covenants and Agreements aforesaid, the said Parties bind themselves each unto the other, firmly by these Presents. In WITNESS whereof, the said Parties have interchangeably to their Hands and Seals Interchanged. Dated the Day of in the Year of the Reign of our Sovereign Lord GEORGE the Third, King of Great Britain &c. Annoque Domini, One Thousand Seven Hundred and

Sealed and Delivered in the Presence of

land in that year. The son erected the buildings which now are occupied by Abeel Bros. The structures now known as 365 Water street, and 10, 12 and 14 James Slip were built by him in 1802 and that at 190 South street, now the main unit in the establishment in 1812. Bricks for these buildings were brought over from Holland and the cement from England. The timbers all were hewn by hand. During the century and a half of the company's history, interesting records have accumulated. One of them is a direct indication of the kind of information relied upon by the trade in selecting material in the old days. It is a book entitled, *Catalogue of Iron*, by E. W. Clay, which was published by the J. Childs Lithographic Press, 119 Fulton street, New York, in 1838. It enumerates approximately 225 different brands of iron and classifies them as "good,"

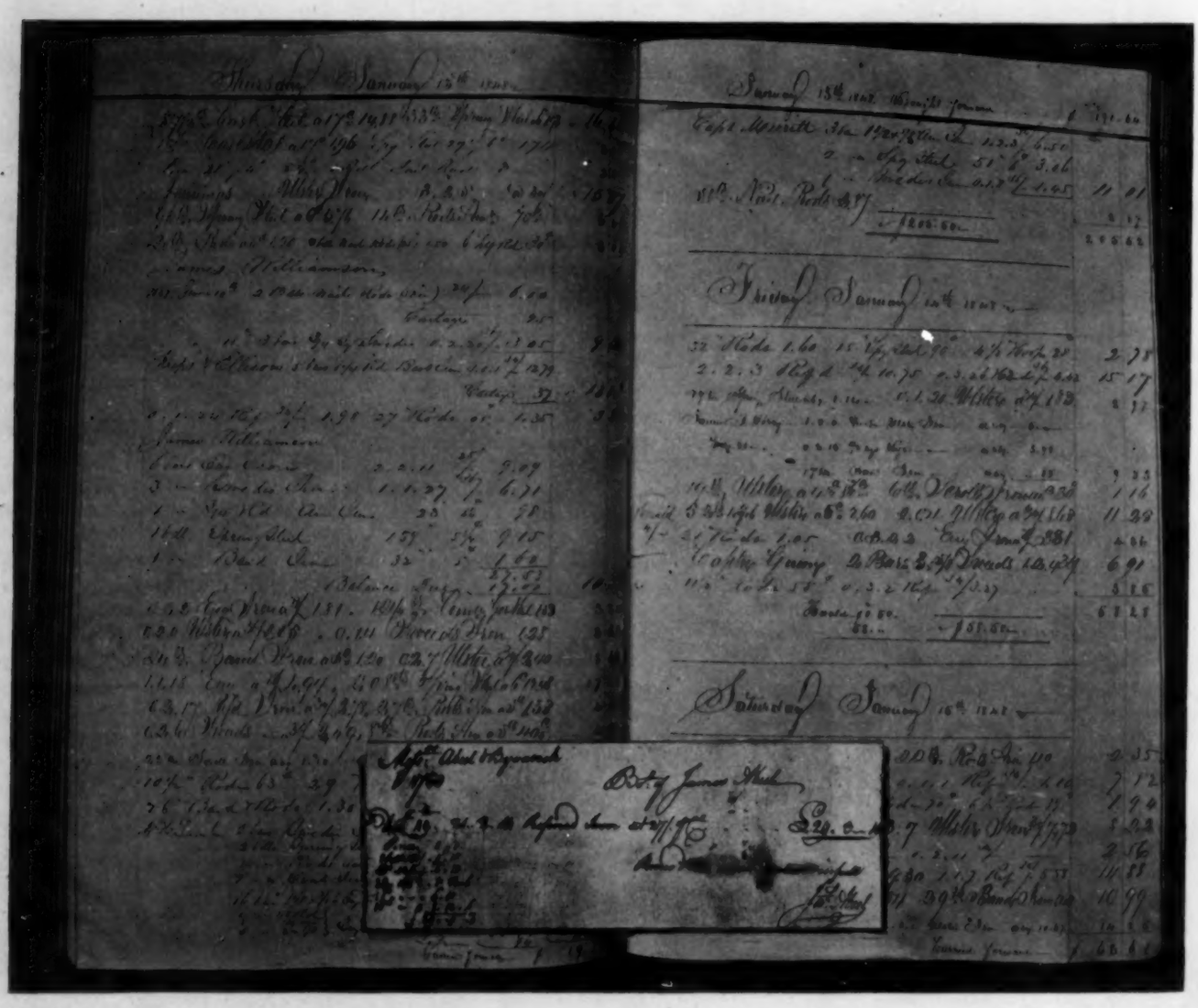
GARRETT ABEEL, WHO IN 1765 FOUNDED THE IRON BUSINESS NOW CARRIED ON AS ABEEL BROS., NEW YORK

"inferior," "very good," "extra good," etc. In those days before the present standards were thought of, such information, aside from his own experience, was all that the buyer had to guide him in making purchases. All of the brands listed in this book were produced abroad. One brand, Molderstein, was listed as "good quality, belonging to the king."

Beginning with Garret Abeel, who was born in 1734 and died in 1799, 12 Abeels have been identified with the company in the unbroken family succession. On some occasions as many as four Abeels were in the business together and at other times the number diminished to one.

Chronologically the succession of Abeels one after another forces the conclusion that the business of warehousing iron and steel under the shadow of the background must have

(*Concluded on Page* 300)



THESE PAGES FROM A RECORD OF 1848 SHOW THAT BY THIS TIME THE BUSINESS OF THE ABEEL COMPANY NO LONGER WAS OF THE GENERAL CHARACTER OF THE EARLY DAYS BUT INVOLVED MOSTLY IRON AND STEEL. THE INSERT IS AN EARLY RECORD BY WHICH ABEEL & BYVANCK, UNDER DATE OF DEC. 19, 1768, ACKNOWLEDGED THE RECEIPT IN FULL OF 21 HUNDREDWEIGHT, TWO QUARTERS AND 14 POUNDS OF REFINED IRON, BOUGHT FROM JAMES ABEEL AT A PRICE OF £29 3s 10d

Welding Defective Steel Ingots

Blow-Holes and Segregate Effect Is Discussed—Explains Test Method for Determining Extent of Interior Influences—Method of Casting Ingot Regulates Imperfections —Sulphur Compounds Most Easily Detectable; Seriousness Overestimated

BY H. BREARLEY

CLEAN surfaces of malleable metals will stick together under pressure at temperatures below those commonly used for welding. Platinum is a case in point. As that metal does not readily oxidize, worn vessels can be repaired by hammering a piece of hot sheet platinum over the defective part. Hot steel can also be welded together under pressure at low temperatures in an atmosphere of hydrogen or other inert gas. Turnings sometimes stick to the cutting edge of tools which are doing heavy work, and it is on record that a cutting tool has been found welded to a heavy forging which was being machined.

Steel oxidizes at comparatively low temperatures. The temper colors, visible on bright steel heated up to 200 degrees Cent. and beyond are, forms of iron oxide which, as the temperature is raised, pass gradually into the more or less adherent oxide of measurable thickness which we call scale. The scale is a brittle substance whether hot or cold; it is not malleable or plastic, and cannot be welded together. At high temperatures the scale melts and could be expressed in the fluid condition from between two metallic surfaces, but the temperature at which it remains sufficiently fluid is near the melting point of steel. At such high temperatures the fluid oxide scale reacts with the carbon of the plastic steel, liberating carbon monoxide, or dioxide, which forms blisters. It is, therefore, not practicable to make a weld without using some means of lowering the melting temperature of the scale, and also modifying the oxidizing effect as it reacts on the hot steel.

Scale Regulates Fusibility

To flux the scale which forms on heating iron and steel, the blacksmith uses sand. The sand-scale slag thus formed should be such as is fusible at temperatures some hundreds of degrees below the melting point of either the scale or the sand. Fusibility varies with the respective proportions of scale and sand used. Too much of either constituent produces a less fusible flux. Since the amount of one of the constituents—the scale—cannot be determined, the most effective quantity of sand to use can be selected only by judgment; it depends on the amount of scale needing to be fluxed, and the area to be covered by the fusible sheath which cleans the surfaces and shields them from further oxidation.

The tensile test is not a satisfactory means of recording the weldability of a steel, or the efficiency of a welding process. Although all welds are more or less defective the position of the plan may be unknown, and consequently when a tensile test-piece has been machined it is a question of chance whether a particular kind of defect is in the core of the test-piece or on its surface. In the former position the defect may not influence the test figures; in the latter position the test-piece breaks either before, or soon after, the maximum stress has been reached, and consequently the ductility figures are unsatisfactory. In the same way the tests made on gun-tube forgings, taken transversely, give erratic results, due not to variations in the suitability of the material, but to the occurrence of haphazard slag streaks.

Being produced under empirical conditions which are difficult to control, there is no wonder that welds apparently similar are really of varying quality. The best of them are never perfect. A weld may appear under certain test conditions to be stronger than the adjacent part, for two reasons: First, because the adjacent parts have been overheated and not hammered; and second, because the welded part has been superficially carburized by the coke fire and to a corresponding extent that part has a higher tensile strength. Both these conditions are due to negligence, and hence,

Table I

Tests To Determine Tensile Strength

Steel *A*

Carbon	Silicon	Manganese	Sulphur	Phosphorus
0.34	0.22	0.75	0.052	0.057

Treatment	Degrees Cent.	Impact edge foot-pounds	Impact center foot-pounds
Oil-hardened at 850 degrees Cent. and tempered at	none	7	18
Oil-hardened at 850 degrees Cent. and tempered at	100	4	5
Oil-hardened at 850 degrees Cent. and tempered at	200	9	12
Oil-hardened at 850 degrees Cent. and tempered at	300	3	6
Oil-hardened at 850 degrees Cent. and tempered at	400	12	20
Oil-hardened at 850 degrees Cent. and tempered at	450	28	48
Oil-hardened at 850 degrees Cent. and tempered at	500	44	112
Oil-hardened at 850 degrees Cent. and tempered at	550	50	120

Steel *B*

Carbon	Silicon	Manganese	Nickel	Chromium
0.34	0.23	0.71	3.26	0.28

Treatment	Degrees Cent.	Impact edge foot-pounds	Impact center foot-pounds
Oil-hardened at 830 degrees Cent. and tempered at	none	3	3
Oil-hardened at 830 degrees Cent. and tempered at	100	6	7
Oil-hardened at 830 degrees Cent. and tempered at	200	17	16
Oil-hardened at 830 degrees Cent. and tempered at	300	4	4
Oil-hardened at 830 degrees Cent. and tempered at	400	20	31
Oil-hardened at 830 degrees Cent. and tempered at	400	24	32
Oil-hardened at 830 degrees Cent. and tempered at	450	23	41
Oil-hardened at 830 degrees Cent. and tempered at	450	25	70
Oil-hardened at 830 degrees Cent. and tempered at	500	39	120
Oil-hardened at 830 degrees Cent. and tempered at	500	39	104

Steel *C*

Carbon	Silicon	Manganese	Nickel	Chromium
0.32	0.23	0.53	3.11	0.06

Treatment	Degrees Cent.	Impact edge foot-pounds	Impact center foot-pounds
Oil-hardened at 850 degrees Cent. and tempered at	none	6	15
Oil-hardened at 850 degrees Cent. and tempered at	100	10	10
Oil-hardened at 850 degrees Cent. and tempered at	200	18	53
Oil-hardened at 850 degrees Cent. and tempered at	300	6	8
Oil-hardened at 850 degrees Cent. and tempered at	400	30	118
Oil-hardened at 850 degrees Cent. and tempered at	450	31	120

From a paper presented at the annual meeting of the Iron and Steel institute, May 5 to 6, 1921.

judging from the comparative behavior of welded and adjacent parts under the stress of a tensile test, the less skillfully the welding is done the better the weld may appear to be.

In 1911 a further means of examining welds was described which maintained that, "the skillful microscopist can, with absolute certainty, determine whether or not surfaces are welded together, a matter of exceeding importance when considering whether cavities in steel ingots can, or cannot, be welded." Certain differences in welds become clear when sections are examined microscopically.

Ingots are never quite free from shrinkage cavities, contraction cavities, cracks, or blowholes. It has been proposed that ingots should be made with a volume of deep-seated blowholes sufficient to neutralize piping and thus avoid the necessity of scrapping a discard head. As this method of avoiding pipe has been in use for many years it is fair to assume that such ingots produce billets, bars, and sheets which are commercially satisfactory for certain purposes. Dr. Stead and others conclude from microscopic evidence, "that the welding of blowhole cavities as a rule is complete and perfect." Their experimental evidence is obtained by boring a hole into an ingot or billet, fitting a plug of the same material, sealing the joint with a blowpipe, raising to welding heat and hammering or rolling it into a bar. If the bar, when nicked and broken across the welded faces, shows no signs of the weld, and the microscopic evidence is satisfactory, it may be assumed that the weld has been made perfectly.

If by perfection we mean a welded joining which is in all respects as good as any unwelded part of the same bar, then it may be said that the evidence is insufficient to support the conclusion even so far as the limited experimental conditions are concerned. The conclusions are a still less satisfactory answer to the question whether blowholes in ingots weld up because a drilled hole is smooth and clean, whereas a shrinkage cavity or blowhole may be uneven, lined with segregates, coated with alumina, or otherwise less favorably disposed to weld completely.

Crankshafts Are Troublesome

During the war trouble was caused by the occurrence in aero-engine crankshafts of small cracks whose origin was camouflaged by calling them "hair-lines." The socalled hair-lines arose mainly from ingot defects, notably those occurring in and about the axis of the ingot. These axial defects are the remnants of shrinkage taking place in the nearly solidified ingot. The small volume of impure metal last fluid moves downward as best it may between the loosely adhering free crystals, filling up the shrinkage and contraction cavities as long as it is hot enough, or impure enough, to keep fluid. It is finally frozen in positions, lying like an inverted cone about the axis of the ingot. It is called a "V" segregate because it can be detected by a sulphide print, but the difficulty lies in the small cavities themselves rather than in the sulphide segregate found in, or near, the cavities.

The "V" cavities are more numerous when an ingot is cast hot than they are when the same type of ingot is cast cold. The remedy is to cast cold in a mold tapered as much as is practicable. The remedy, however, does not remove entirely the cavities, remnants of them may appear either as split centers, if the forging be carelessly done, or as small seams or "hair-lines," however skillfully the forging operation may be carried out.

Minor defects inherent in commercially sound ingots, and small blowholes which may occur accidentally do not weld up in nickel-chromium steels, because steel containing chromium will not weld. Aero crankshafts and other important structural components, made from nickel steels, or better still, from carbon steels, the greater weldability of these steels will alleviate all difficulties. When this idea is tested under conditions more favorable than those occurring in practice, by drilling holes along the axis of a bloom, inserting a machined bar of the same material, and after hermetically sealing the ends, rolling the bloom into a small bar, which is then nicked and broken, then we arrive at curious results. Some steels tested in this way were ordinary mild steels containing 0.15 per cent and 0.35 per cent carbon, a 3 per cent nickel steel, a 5 per cent nickel case-hardening steel, and a nickel-chromium steel, as was used for aero engine crankshafts. On etched transverse sections of the bars the weld lines were either not visible or slight indications only were discovered. When the bars were nicked and broken across the welded surfaces all the steels, judging from the fractures, appeared to have welded satisfactorily except the 0.15 per cent carbon steel and the 5 per cent nickel case hardening steel. Tough mild steels weld less perfectly than nickel-chromium steel.

On hardening and reheating the entire series of steels so as to put all of them into a tough condition having Izod figures of over 50 foot-pounds, not one of them withstands the nicked bar test; without exception they pull apart at the welded surfaces. These results explain why transverse fractures of nickel steels appear to be more reedy than similar fractures made in ordinary carbon steel, the nickel steel is tougher and therefore pulls open on the faces of welded blowholes, or slag breaks, more than in less tough carbon steels; the steel itself is not more reedy in the sense that it contains more slag streaks, or less perfectly-welded blowholes.

Discusses Chromium Steel

Steel which contains chromium can be welded under such conditions as apply to the welding of cavities in ingots. If, however, some means is sought of expressing the extent to which such steels weld, as compared with ordinary carbon steel, we should endeavor to state comparative results in concrete figures. Some method is desirable, if we are to explain the known difficulties in forging special steel and understand the effects of blowholes and segregates on the properties of steels containing them.

The steels to be examined are prepared as 3½-inch billets. A hole 1 inch in diameter is drilled down the axis of the billet, and a turned bar is driven into it and fused over at each end. The cored billet is then rolled into a bar 4½ inches by ½ inch. The test piece cut from the side will be broken by a force recorded in foot-pounds which represents the effort required to start a crack at the root of the sharp notch and extend the crack across the specimen. The test piece cut from the center of the bar is broken in the same way, but it will require a greater force to extend the crack across the specimen, depending on the perfection of the weld between the core and inside of the hollow billet. If no welding has occurred the crack will come to a stop when it reaches the core or leaves it, and a new crack would need to be started in each case. This absorbs more energy than is required to propagate a crack which has already been started.

Hard steels have low impact values because the material in and about the notch is not able to distort, and such steels, even in the form of cored bars, break across readily. Conversely, steels having low impact values, whether they are hard or not, fracture readily across welded cores, and this explains the insufficiency of the nicked bar test as an indication of good or unsatisfactory welding. To pull a weld apart the material should be toughened. The proposal is to measure the perfection of a weld in terms of the degree of tough-

ness which must be induced in the steel before the weld can be pulled apart.

A series of specimens cut respectively from the edge and center of the flat bar, prepared as described, are hardened and tempered in stages of 100 degrees Cent. up to 700 degrees Cent. These are broken on a standard Izod machine, and the impact value of the edge specimen whose corresponding piece cut from the center is split along the weld is taken as the welding figure. Examples of the process are given in Table I.

From these results the comparative welding figure selected would be: Steel *A*=28 or rather less, steel *B*=20 steel *C*=18. These figures represent in Izod foot-pounds the degree of toughness which must be induced in the steels by hardening and tempering in order to pull the welded surfaces apart into a visible gap.

If instead of rolling into flat bars the cored billets are rolled into round or gothic, or square bars, and tensile pieces are prepared from the bars which have been heat treated to develop maximum toughness in them, the core will sometimes be visible in the broken tensile test piece, and sometimes not visible. The sample of 3 per cent nickel steel had, when tested, a maximum stress of 44 tons, an elongation of 29 per cent on 2 inches by 0.564 inch and a reduction of area of 65.8 per cent.

Describes Microscope Tests

For microscopic observation a transverse section could be cut from the flat bar on which, if the welded faces were well defined, the core would be represented by the outline of an ellipse. The pointed ends could be traced in all the specimens, but it was more marked in the alloy steels than in the carbon steels.

To increase the separation of ferrite in the carbon steel and promote its separation, if possible, in the alloy steels, samples of each of the four alloy steels were heated to 860 degrees Cent. and cooled down to 500 degrees Cent. in nine to ten hours. Etched sections made from these specimens now showed a band of ferrite about the welded surfaces of all the steels except the nickel-chromium steel.

The appearance of free ferrite about welded surfaces recalls the occurrence of the banded ferrite structure in mild steel plates and bars. The banded structure has been ascribed to microsegregation of phosphorus. It has been suggested that nonmetallic impurities in steel in the form of slag streaks, etc., act as nuclei around which the ferrite gathers as it falls out of solution, just as sugar candy crystals form about a thread suspended in the liquor. While the formation of free ferrite on the welded faces falls naturally into its place as a special instance of the effect of nuclei action, it is difficult to see how it can be related to phosphide segregation. It should not be concluded that nickel-chromium steels behave exceptionally until lower carbon steels of the same type, or more slowly cooled steels in which free ferrite exists abundantly, have been obesrved.

The conditions, described before under which the coefficient of weldability is determined, are obviously empirical, and it would probably be necessary to adhere to given dimensions of billet, the inserted core, and the rolled flat bar in order to get consistent results. To observe the effect of deviations a 4-inch square billet was prepared with the usual 1-inch core, with a half-inch core and with a half-inch hole, the end only of which was plugged. In the rolled flat bar the welded surfaces would be a single one in the case of the half-inch plugged hole, and double ones in the cases of the half-inch and 1-inch cores. The welded surfaces would also lie variable distances below the bottom of the notch. The actual figures obtained both on softer and harder steels did not show great variations, and they were all in such directions as might be expected. The effect may be summarized by saying that when the hardened and tempered pieces are sufficiently tough to cause the weld to split open the impact value obtained from the welded pieces depends on the thickness of metal behind the split weld which has to be bent by the pendulum hammer. While useful information may be obtained whatever size of billet and bar is used, it is advisable to adhere to fixed sizes if the results are required to be strictly comparative.

Table II

Effect of Segregates

Carbon	Silicon	Manganese	Sulphur	Phosphorus
0.46	0.15	0.70	0.040	0.030

Condition of steel	Percentage increase in diameter of drifted rings made from Unsound part	Sound part
As rolled	2.4	14.5
As rolled	3.4	12.6

Carbon	Silicon	Manganese	Sulphur	Phosphorus
0.15	0.23	0.92	0.060	0.018

Condition of steel	Percentage increase in diameter of drifted rings made from Unsound part	Sound part
As rolled	2.7	20.8
As rolled	7.8	22.9

No pipe or cavity in an ingot can be completely welded. The degree of imperfection of welds is made manifest by a rise in the impact figure. Were no welding to take place the impact test specimen used would bring the testing machine to a dead stop, although the material was not in a tough condition. If the material of a piped ingot, or a blown ingot, be stressed transversely to the direction in which it has been elongated by forging or rolling, such stresses carried to the point of fracturing will have more work to do than under similar circumstances would be required to fracture such material made from a sound ingot. The plate of a laminated spring is one of the best examples of the truth of this deduction, and as a matter of experiment it is found that a cambered spring plate made from the top of a piped ingot cannot be broken by scragging as easily as a similar plate made from the bottom end of the same ingot. Blown ingots or those rich in nonmetallic impurities, make good spring plates, and it is mainly on this account that bessemer steel is preferred by many spring makers to the more carefully melted and cast open-hearth steel. To some extent the same advantages apply to straight axles, and they are worth consideration even in relation to rolled tyres. The virtue of all good wrought iron fiber should be regarded as a defect in steel. It should be valued of course like the grain in wood, according to its direction, in relation to the stresses put upon it.

Segregates Influence Welds

Pipe, or blowholes, or any other form of cavity in ingots is apt to be, and usually is, associated with segregated carbon, phosphorus, and sulphur. If, therefore, the discussion be confined to the welding of ingot cavities it would be instructive to know how far the cohesion of the welded surfaces is influenced by carbon, phosphorus and sulphur respectively, and whether the influence of these elements present in the same specimen is additive or otherwise. Successful welding of blowhole cavities depends either on microscopic observation which may be illusory, or on the nicking and breaking method which may be misleading. Of the two methods of judging a weld it is claimed that "nicking and breaking was a more certain method than that of the microscope." As the nicking and breaking method carried out on bars in the forged and rolled condition would lead us to believe that all hardening elements added to steel, including phosphorus, will improve its welding properties, therefore its results obviously need to be interpreted with caution.

Generally stated, without any ex-

perimental warrant being adduced, all segregates existing in ingot cavities decrease the weldability. It has been assumed that in the absence of segregates a perfect weld could be made, and as segregates and imperfect welds often found together the presence of the segregate and the degree of imperfection are regarded as cause and effect. This conclusion is untenable now we know that perfect welds cannot be made even under the most favored conditions.

Describes Experiment

For experimental purposes two crucible ingots containing 0.020 per cent sulphur were prepared. One was blown and the other sound. Both were forged into round bars and parts of each bar were turned into annular rings. When drifts were forced into the rings those made from the blown steel broke with 50 per cent less extension than those made from sound steel. A sulphur print taken from the forged bars showed the location of the blowholes, because segregates had been pressed into them by such forces as operate in every solidifying ingot. The weakness of the one set of rings as compared with the other was ascribed to the presence of sulphide segregates. Such a conclusion, however, is only justified if it can be shown that identical rings made from blown steel containing no segregated sulphide are practically as strong as rings made from sound steel. A direct experiment on these exact lines cannot be made because it is impossible to produce commercial ingots containing blowholes without these holes being more or less lined with segregates. But as the blowholes could not weld completely under any circumstances it is likely that the rings were weaker in one case than the other, quite apart from any question of segregation.

To test this supposition a dozen small holes were drilled lengthwise to a depth of 8 inches into a 4-inch billet. Each hole was cleaned, dried, and filled with petrol vapor before being closed by plugs 1 inch long driven in with a sledge-hammer, and fused over with the oxyacetylene blowpipe. The billet was rolled into a ⅞-inch round bar. From the sound and unsound parts of the round bars annular rings were turned. The rings were drifted until they broke. Results of the test may be seen in Table II.

Sulphur prints were made from both the sound and unsound bars, but there was no distinction between them. These results appear to negative the conclusion of the other experiment that the annular rings broke prematurely on account of sulphide segregation; they would have broken prematurely in any case, because blowholes or any other cavity in an ingot do not weld completely however much work may be put on to the material during forging or rolling.

The difference in behavior between the sound and unsound rings when drifted is an example of the disadvantages of blown or piped steel when stressed transversely. Gum tubes or gas cylinders are stressed more or less like the drifted rings, though they are not made into hollow tubes in the same way, and a welded blowhole would lie more favorably in either case than in drifted rings. Gum tubes are not made from blown ingots, but blown ingots of mild steel are consciously made into billets and blooms for tubes and gas cylinders. Whatever commercial warrant there may be for this practice it would appear to be undesirable metallurgically, because blowholes induce spot segregates, and are undesirable mechanically because the incompletely welded cavity decreases and resistance of the steel to the working stresses.

There seems to be little doubt that sulphur has been blamed for defects due to other causes, and one wonders whether this segregate in particular is quite as harmful as it is made out to be. Take, for example, a piece of boiler plate which has laminated on flanging. The metallurgist applies a piece of acidified photo paper and produces a sulphur print, showing that the defective part corresponds with a segregated area. According to text-books segregates are known to be harmful and high sulphur is reputed to cause red-shortness. Sulphur compounds segregate in steel; so do phosphorus, and so also do carbon compounds. Of these the one most easily detectable, and almost invariably detected, by the method of sulphur printing is sulphur, but it is not therefore necessarily more culpable than either phosphorus or carbon. Further, in perfectly sound ingots, except perhaps large ones, mass segregation is not possible. In such ingots as are practically sound, that is to say, in the best type of commercial ingots, mass segregates are found only where there are, or have been, cavities. The pipe in a piped ingot is lined with segregates and most cavities in a blown ingot are distinguishable in the forged blooms by the segregates which filled, or partly filled, the cavities in the ingot stage.

Dark Center Shows Piping

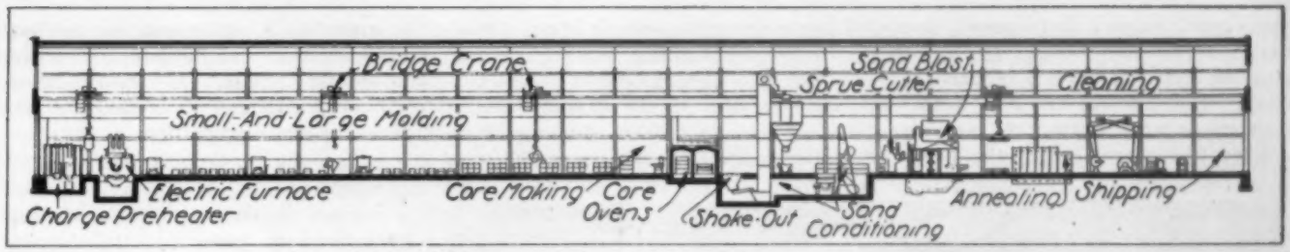
On reconsideration of the laminated boiler plate we must regard the dark center part on the sulphur print first as evidence that the ingot material from which the defective article was made was piped. Sulphide segregates enable us to draw this conclusion, but whether the segregates as a whole have aggravated the defect depends on whether or not they have interfered with the chances of the pipe welding up. The facts are broadly the same with respect to spot segregates. In either case, in relation to both axial segregates and spot segregates, the real cause of the trouble is either a pipe or a blowhole, and it is not reasonable to blame the segregate, which in the nature of things gets squeezed into these cavities, unless they interfere with welding.

Pulling Apart Welded Faces

Few experienced observers will doubt the possibility of pulling apart welded faces in objects made from blown ingots. The author believes that it can be done, always providing the steel in which they occur is tough or can be made tough by heat treatment. Iron and steel lumps from which bars for machine knives are made are produced by casting mild steel against the face of hot tool steel. In the forged or rolled bar the interpenetration is considerable. The two materials, however, can be pulled apart along the original faces. Three-ply steel, such as is used for making plough mold boards, is probably produced in a similar way.

If a billet be drawn down at one end into a bar the unforged part of the billet may be worked up and down in fluid steel as it rises in an ingot mold, so as to heat the billet and drive off adherent gases. Such a billet may then be left in the upper part of the ingot in a preheated and clean condition. After forging that part of the ingot containing the billet may be rolled into flat bars and such bars may be tested. After this procedure a core corresponding with the original billet section may be separated.

From these considerations one would expect that impact test pieces cut from the center and from the edge of a flat bar rolled from an ordinary ingot would frequently give different results. Such differences actually exist, and moreover the difference is most marked when the bar is taken from that part of the ingot which is unavoidably least sound. An ingot cast wide end up and provided with an efficient feeder head is—omitting the feeder head—most nearly perfect in its bottom third and top fourth; it is less perfect in the center of its middle half. These facts are clearly discernible in a sulphur print made from a sound ingot which has been sectioned longitudinally through its center. Quite in accordance with the sulphur print indications one finds that variations in impact test pieces cut from the edge and center of flat bars are greater or less, according as the bars have been made from the middle or one or other extremity of ingot.



The Movement of all Material in a Straight Line Is Shown by This Sectional Elevation

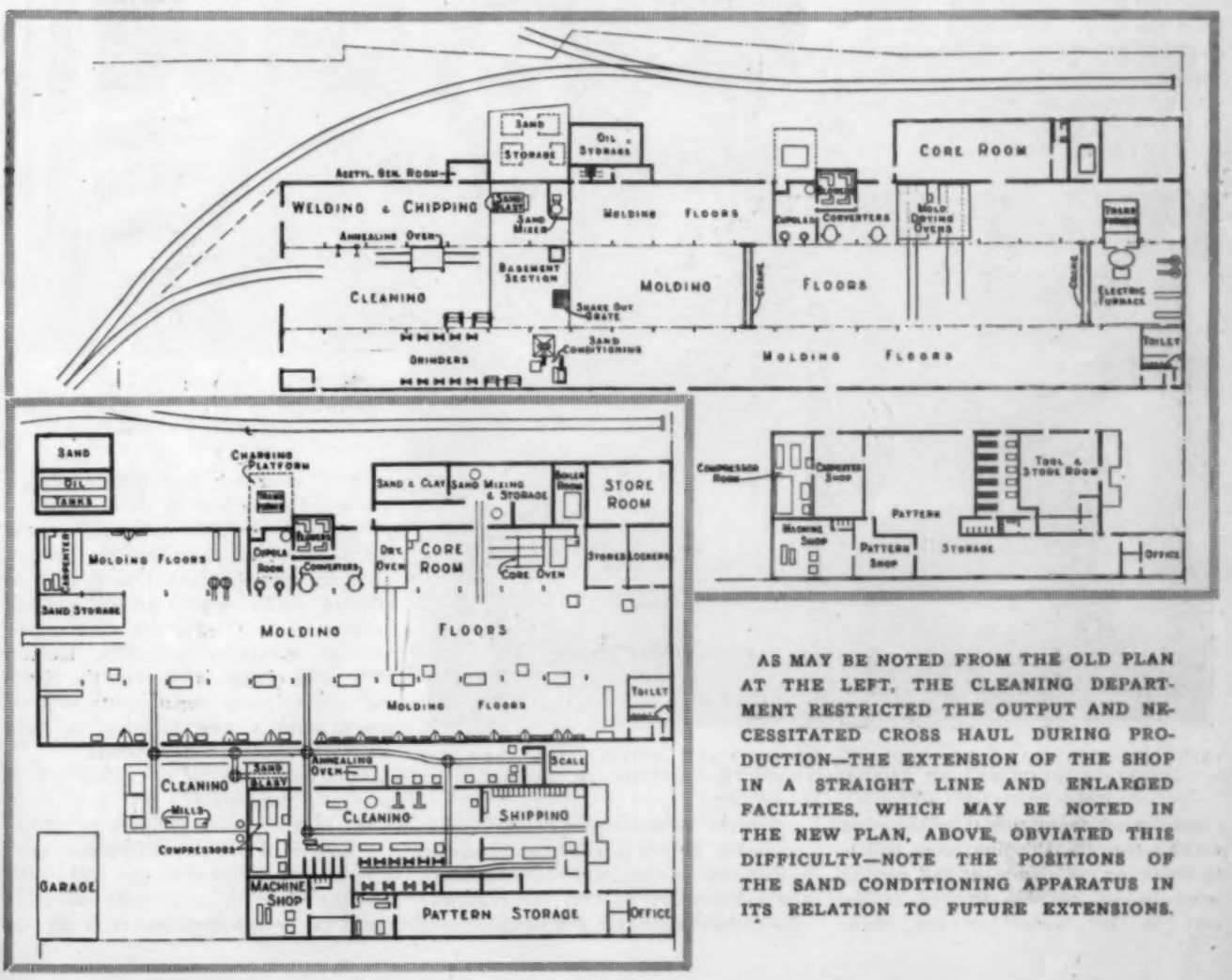
Changes Make Casting Plant Efficient

BY GEORGE H. MANLOVE

DEVELOPMENT of a straight-line foundry in which the iron enters at one end and travels steadily in the same direction and a process of making steel in the electric furnace, adding all alloys and completing the refining in the furnace, instead of depending on reactions in the ladle, sum up the accomplishment of the Chicago Steel Foundry Co., Chicago, in a recent remodeling of its plant. The work was carried out under direction of Frank D. Chase, Inc., engineers, Chicago.

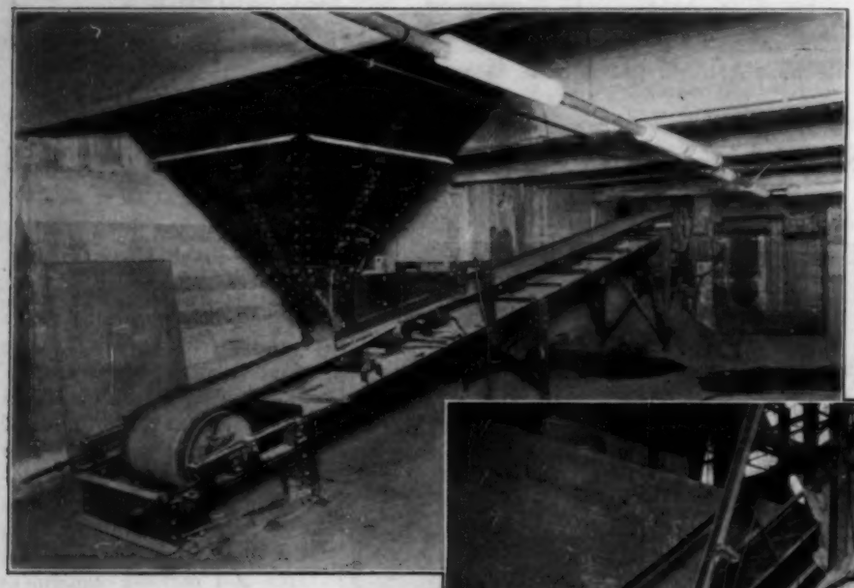
THE WIDE VARIETY OF CASTINGS IS EVIDENT FROM THESE TYPICAL EXAMPLES

The problem presented to the company was to utilize the plant it already possessed, a ground plan of which is shown at the left at the bottom of this page and to develop the entire property for an eventual production of 1000 tons of castings per month. In the old plant the molding area and molding equipment were sufficient for production of 315 tons of castings per month; but the capacity of



AS MAY BE NOTED FROM THE OLD PLAN AT THE LEFT, THE CLEANING DEPARTMENT RESTRICTED THE OUTPUT AND NECESSITATED CROSS HAUL DURING PRODUCTION—THE EXTENSION OF THE SHOP IN A STRAIGHT LINE AND ENLARGED FACILITIES, WHICH MAY BE NOTED IN THE NEW PLAN, ABOVE, OBVIATED THIS DIFFICULTY—NOTE THE POSITIONS OF THE SAND CONDITIONING APPARATUS IN ITS RELATION TO FUTURE EXTENSIONS.

the core room and core ovens was inadequate for this tonnage, and the cleaning department was entirely too small. The sand blasting and tumbling department formed a pocket which restricted free movement of the product from the shop. After sand blasting, it was necessary to carry the castings back through a 10-foot passageway between the foundry and the sand-blasting room to be ground, shipped and welded. The latter department was insufficient and caused much congestion about the grinders. Further the shipping room had no facilities for rail shipments and castings must be trucked 180 feet to railway cars to be hauled to the dump.



FROM THE SHAKEOUT GRATE, THE SAND IS PASSED OVER A MAGNETIC SEPARATOR TO AN ELEVATOR

CORE AND FACING SAND IS PUT THROUGH A SPECIAL MIXER OR GRINDER BEFORE DELIVERY

RIDDLE, ELEVATOR AND STORAGE HOPPER ARE ABOVE THE FOUNDRY FLOOR—BUGGIES ARE LOADED FROM THE HOPPER AS SHOWN

In developing the present plant, a modern cleaning building was erected and several other departments were reorganized with the object of proportioning the various divisions so they would coordinate properly and so each could operate at its highest efficiency. Future expansion also was taken into account.

The new building is a continuation of the old foundry so that the craneway was merely extended; but the roof over the main bay is higher and provides better ventilation and lighting. The roof on the old building was raised to allow additional sash and to conform to the design of the new portion.

As has been noted the equipment is arranged to permit continuous movement of castings through the cleaning department from the foundry to the shipping area. Reference to upper plan indicates nature of changes in arrangement. The space formerly used by the cleaning and shipping departments has been utilized as a wash and locker room, space for general foundry storage, pattern storage, carpenter, pattern and machine shops. The core room has been rearranged to extend into the space vacated by the sand mixing department, and an additional core oven brings this department into balance with the remainder of the foundry, sufficiently increasing its capacity.

Present plans look to an eventual capacity of about 1000 tons per month. As indicated in the plan, the present cleaning room is planned so it may be adapted readily to give greater molding area which will leave the sand conditioning apparatus centrally located. When this change is effected, the cleaning and shipping departments will be moved into a new building at right angles to the present structure.

Several features in this plant are of particular interest. The first is arrangement of the molding floors to utilize the service of a tractor conveying sand from the sand hopper to one side of the molding floor in a specially designed dump car, which then passes to the op-

posite side of the molding floor and receives a load of sand and castings dumped from the flasks. This load is conveyed to the shakeout grate, and the train of dump cars return with another load of sand. This loop gives service both ways and not only supplies the molders with sand but keeps their floors clear of molds and used sand. The dump buggies are equipped with two buckets, which will contain sufficient sand to meet the molders' requirements and further, are small enough to be handled by one man. The tractor used is the type made by the Mercury Mfg. Co., Chicago.

SPECIAL BUGGIES WITH TWO LIGHT DUMP CONTAINERS FOR SAND ARE DRAWN IN TRAINS BY A STORAGE BATTERY TRUCK—A TRAIN OF THESE CAN BE HAULED

Another feature is the handling of sand. Extending across the foundry, at right angles to the line of travel of castings, is a subway beginning in the sand storage just outside the foundry walls into which sand is dumped by grab bucket through hatch covers. Storage for 35 cars of sand is provided. Just inside the building in the subway is a sand mixer with an elevator made by the National Engineering Co., 549 W. Washington Blvd., Chicago, which is used for mixing facing. Further along in the subway is a hopper into which sand from the shakeout grate is deposited. From this it is fed to a belt passing over a magnetic separator which removes all the iron. An elevator then carries the sand to the conditioning apparatus at the top of the foundry building where it is moistened and revivified and deposited in a 35-ton storage bin above the foundry floor. It then is dropped into the dump cars to be carried to the molding floors. The sand handling equipment was built by C. O. Bartlett & Snow Co., Cleveland.

On being separated from the sand, castings are passed through the cleaning department which is equipped with two large and two small tumbling barrels which are exhausted through the trunnions. One of the large barrels was made by the Whiting Corp., Harvey, Ill., and the other three by the W. W. Sly Mfg. Co., Cleveland. The castings then are carried to the sand blast, which is a combination table and room device for various sized castings built by the Hoevel Mfg. Corp., Jersey City, N. J., and then to the grinding machines, of which there are two swing grinders and 12 double floor grinders. The swing grinders were designed by the company itself, and these with the stand grinders were made by the Safety Emery Wheel Co., Springfield, O. In this department the tractor has another loop, leaving cars filled with castings ready for grinding and picking up cars on the other side of the machines in which ground castings have been deposited. An oil fired annealing furnace completes the equipment in this department, with the exception of that located in the welding and chipping room.

A REMOVABLE TOP PERMITS THE ENTIRE CHARGE TO BE DROPPED INTO THE FURNACE FROM SPECIAL BUCKETS

Steel is produced in a 3½-ton electric tilting furnace, heated by three electrodes, using a three phase current. This furnace which was made by the Industrial Electric Furnace Co., 53 W. Jackson Blvd., Chicago, has the three electrodes passing through a removable top or tilting roof. Electric current is secured from the central station at 12,000 volts and is passed through a 1500 kilovolt-ampere transformer which steps it down to 180 volts for the furnace and through three 150 kilovolt transformers to reduce it to 220 and 110 volts for power and light.

The transformer room has been provided with every safety device possible to protect the equipment and machinery, as well as the safety of men whose work calls them into proximity to the current.

(*Concluded on Page* 301)

Trend of Pig Iron Production

EACH upright column is proportional to output of pig iron and castings in each year. The line through the diagram indicates the normal growth of output, and the theoretical production each year.

Tons in Millions

June Rate

Year	Output Thousand Tons Actual	Normal	Per Cent Actual of Normal
1896	8,623	9,788	88
1897	9,653	10,955	88
1898	11,774	12,123	97
1899	13,621	13,291	102
1900	13,789	14,459	95
1901	15,878	15,627	101
1902	17,821	16,794	106
1903	18,009	17,961	100+
1904	16,497	19,130	86
1905	22,992	20,297	113
1906	25,307	21,465	117
1907	25,781	22,633	113
1908	15,936	23,800	67
1909	25,795	24,968	103
1910	27,304	26,136	104
1911	23,650	27,304	87
1912	29,727	28,471	104
1913	30,966	29,639	104
1914	23,332	30,807	76
1915	29,916	31,974	93
1916	39,435	33,142	118
1917	38,621	34,310	112
1918	39,055	35,477	110
1919	31,015	36,645	84
1920	36,926	37,813	97
1921	13,079	38,981	33
1922		40,148	
1923		41,316	
1924		42,484	
1925		43,651	
1926		44,819	

Trend of Production of Steel Ingots and Castings

EACH upright column is proportional to output of steel ingots and castings in each year. The line through the diagram indicates normal growth of output, and the theoretical production each year.

Tons in Millions

June Rate

Year	Output Thousand Tons Actual	Normal	Per Cent Actual of Normal
1896	5,282	4,498	117
1897	7,157	6,057	118
1898	8,933	7,615	117
1899	10,640	9,174	115
1900	10,188	10,732	94
1901	13,474	12,291	109
1902	14,947	13,849	107
1903	14,535	15,408	94
1904	13,860	16,966	81
1905	20,024	18,525	108
1906	23,398	20,083	116
1907	23,363	21,641	107
1908	14,023	23,200	60
1909	23,955	24,759	96
1910	26,095	26,317	99
1911	23,676	27,876	84
1912	31,251	29,434	106
1913	31,301	30,993	100
1914	23,513	32,551	72
1915	32,151	34,110	94
1916	42,774	35,668	119
1917	45,061	37,227	121
1918	44,462	38,785	114
1919	34,671	40,344	85
1920	42,133	41,902	100+
1921	14,809	43,461	34
1922		45,019	
1923		46,578	
1924		48,138	
1925		49,695	
1926		51,253	

Steel Shrinkage Is Unparalleled

June Production of Pig Iron and Steel About 30 Per Cent of Theoretical Normal, Lowest Ever Shown—Per Capita Output Extraordinarily Reduced—Early Recovery Indicated—Regression Line Forecasts 51,000,000 Tons in 1926

BY JOHN W. HILL

THE present depression in the iron and steel industry is historic. Proportionate to the capacity of mills and blast furnaces, the curtailment of activities in recent months stands wholly without parallel. All fundamental indications, however, point to the fact that the reaction has been too drastic and too widespread to be of long duration, and that it represents merely a passing phase which has interrupted, temporarily, the steady normal growth of the industry.

Steel is the universal metal of the complex machinery of present day production processes. To a larger extent than many realize it has made possible the high development of the mechanical arts and the advanced scale of life's comforts which are the marvel of the twentieth century. The everyday life of modern civilization could not be carried on without it.

Since there is no evidence that the modern equipment of the manufacturing and commercial life of the nation is to be scrapped, that civilization is to retrograde, or that standards of living are to be seriously lowered, it is clear that the production of steel cannot long remain below the minimum level required to maintain the existing organization of society. Moreover, it is evident that if civilization is to continue its forward march it must have ever increasing supplies of this essential material.

Upward Turn Expected

Even now signs are beginning to appear that the depression in the industry has touched bottom and that the pendulum is beginning to swing upward again. This development was inevitable because, even with the reduced state of general business, there are many convincing reasons for believing that the consumption of steel has been in excess of recent output. All the indices reflecting the country's aggregate trade volume such as bank clearings, coal production, car loadings, and building construction, show activities ranging from 50 per cent to 80 per cent, or more, of the 1920 rate. The steel industry, on the other hand, in June slumped to 33 per cent of the rate of operations in 1920. This condition forecasted the recovery of such a vital industry as steel to a level more in line with general business in the immediate future.

With a view of throwing some light upon the longer future of the iron and steel industry, THE IRON TRADE REVIEW has undertaken two studies of the past record of growth of production of pig iron and of steel ingots and castings. One of these studies concerns the expansion of actual output over a period of 25 years measured against a statistical normal trend line which projects into the future and indicates the rate of operations to be expected logically in the next few years.

The other is based upon the per capita production of pig iron since 1854 and of steel ingots since 1878. In both surveys the annual rate of output for pig iron and for steel in June of this year is compared with the full years previously. This comparison reveals in a striking manner the current year's unprecedented curtailment.

The results of the first study are pictured in the graphic charts entitled "Trend of Pig Iron Production" and "Trend of Production of Steel Ingots and Castings". In these diagrams each upright column is proportional in height to the number of tons of pig iron or steel produced in the United States in that year.

It will be observed that the annual output of steel has been rapidly increasing over the last quarter of a century, as its circle of usefulness has widened with the march of civilization and the standard of living. During years of financial panic or business depression such as in 1900, 1904, 1908 and 1914 the output has been comparatively low and in the intervening years of economic prosperity it has been correspondingly high.

The record indicates that the consumption of iron and steel is rapidly and steadily increasing and that the rate of gain has remained relatively constant.

The general trend of expansion has been indicated by a straight line drawn through each diagram. This line is known as the regression line or the line of least squares, and it is frequently employed to express the long distance trend of an irregular series. It is mathematically computed and may be described as the straight line from which the irregular line deviates less than from any other straight line. Such foremost statistical authorities as Col. L. P. Ayres, vice president of the Cleveland Trust Co., regard the regression line as providing the most reliable available method of ascertaining the normal trend of a fluctuating curve.

In the present instance these lines may be considered as representing in each case the normal output of pig iron and of steel ingots. Consequently they furnish a basis for forecasting the future growth of the iron and steel industry. Representing trends that have been constantly operating for a quarter of a century, they offer the best available basis for estimating the probable output during the next few years.

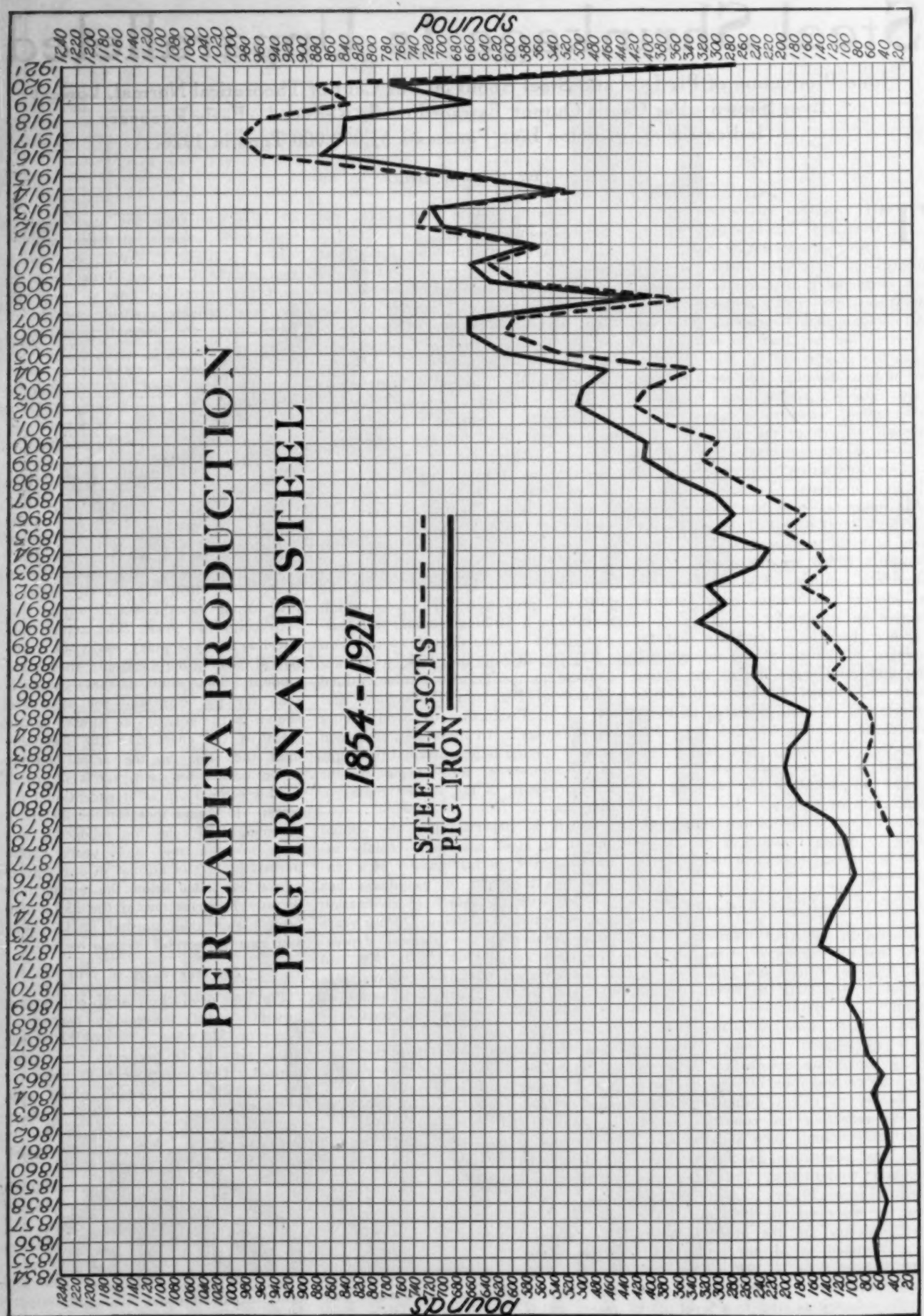
This regression line through the 26 years since 1896 is seen to indicate the normal or theoretical output for each respective year. The actual output for any year may easily be compared with this normal theoretical amount. The results of these comparisons for pig iron and for steel are shown in the columns of figures at the right of the chart. In the last column the ratio of the actual output to the normal for each year is shown.

This comparison is of exceptional interest. It shows that for the 25 years preceding 1921, pig iron production has been below normal in 11 years, above normal in 13 and normal in one. Steel output has fallen below the normal line in only 10 years out of the 25; it has been higher than normal in 13 years and exactly normal in two years.

Pig Iron Crest In 1916

Pig iron production advanced to the greatest point above the theoretical figure in 1916 when it totaled 39,055,000 gross tons or 18 per cent more than normal. The output of 25,307,000 tons in 1906 stands in second place with 117 per cent of normal. Steel production was 21 per cent above normal in 1917; 19 per cent above in 1916, and 18 per cent above in 1897.

Of great significance is the record of years when production has fallen below normal. The worst depression in its effect upon the iron and steel industry came in 1908. In that year the production of pig iron slumped to 67 per cent of the normal expected output, while steel operations contracted to 60


PER CAPITA PRODUCTION
PIG IRON AND STEEL
1854 - 1921
STEEL INGOTS
PIG IRON
Pounds
Pounds

Steel Production Per Capita

Year	Population in millions	Steel output tons in millions	Steel output pounds in billions	Output per capita pounds
1878	47,598	732	1,639,680	34
1879	48,886	935	2,094,400	42
1880	50,156	1,247	2,783,280	55
1881	51,316	1,588	3,557,120	69
1882	52,495	1,736	3,888,640	74
1883	53,693	1,673	3,747,520	69
1884	54,911	1,550	3,472,000	63
1885	56,148	1,711	3,832,640	68
1886	57,404	2,562	5,738,880	99
1887	58,680	3,339	7,479,360	127
1888	59,974	2,899	6,483,760	108
1889	61,298	3,385	7,582,400	123
1890	62,948	4,277	9,580,480	152
1891	63,844	3,904	8,744,960	121
1892	65,086	4,927	11,036,480	169
1893	66,340	4,019	9,002,560	135
1894	67,632	4,412	9,882,880	146
1895	68,934	6,114	13,691,360	198
1896	70,254	5,281	11,829,100	168
1897	71,592	7,156	16,029,440	223
1898	72,947	8,932	20,007,080	274
1899	74,318	10,639	23,831,360	320
1900	75,995	10,188	22,811,120	300
1901	77,612	13,473	29,179,520	375
1902	79,231	14,947	33,481,280	422
1903	80,848	14,534	32,566,160	402
1904	82,467	13,859	31,044,160	335
1905	84,085	20,023	44,851,520	533
1906	85,702	23,398	52,411,520	611
1907	87,320	23,362	52,330,880	599
1908	88,939	14,023	31,411,520	353
1909	90,556	23,955	53,659,200	592
1910	92,174	26,094	56,450,560	634
1911	93,682	23,676	53,034,240	565
1912	95,097	31,251	70,002,240	736
1913	96,512	31,300	70,112,000	725
1914	97,927	23,513	52,669,120	509
1915	99,342	32,151	72,018,240	724
1916	100,757	42,773	95,811,540	959
1917	102,172	45,060	100,934,400	987
1918	103,587	44,462	99,594,880	961
1919	105,003	34,671	87,663,040	834
1920	106,418	41,902	93,860,480	884
1921	107,833	14,809	33,172,160	307

per cent. Compared with this the annual rate of pig iron output in June of 1921 was but 33 per cent of the theoretical output and the production of steel ingots and castings was but 34 per cent.

January was the low month in operations for the year of 1908, yet the annual rate of pig iron production in that month was 52 per cent of normal. This vividly pictures the existing extreme depression in the industry.

Normal production has been attained for pig iron only in 1903 according to the chart. Compared with the sharp curtailment in 1921 and the somewhat less important contraction in 1908, other depressions in the last quarter of a century have had a negligible effect upon the iron and steel industry. The financial troubles of 1900 reduced blast furnace operations but 5 per cent, and steel mill output by 4 per cent. That of 1904 produced a more far-reaching impression upon the industry. Pig iron tonnage was cut down 14 per cent and steel 19 per cent. The trade reversal of 1914 caused the production of pig iron to fall off 24 per cent from normal, while that of steel declined 28 per cent.

Normal output was attained for steel in the two years of 1913 and 1920. Pig iron tonnage at 97 per cent of normal last year however was virtually equal to the theoretical trend line. Carrying the computation of normal output through to 1926 it is discovered that by that date, pig iron tonnage should amount to 44,819,000 and that of steel to 51,153,000. The following table shows the theoretical output for five years from 1922 to 1926 inclusive:

	Pig iron	Ingots and castings
1922	40,148,000	45,019,000
1923	41,316,000	46,578,000
1924	42,484,000	48,138,000
1925	43,651,000	49,695,000
1926	44,819,000	51,153,000

One important and interesting feature of the trend in the steel industry is to be found in the fact that steel production has been increasing in recent years more rapidly than pig iron production. The tonnage of steel output overtook pig iron in 1911 and in the following year it forged ahead. Since that time it has maintained the lead. Even in June of this year the annual rate of steel output was greater

Pig Iron Production Per Capita

Year	Population in millions	Pig iron output gross tons in millions	Pig iron output pounds in billions	Output per capita pounds
1854	25,000	657	1,471,680	59
1855	26,000	700	1,568,000	60
1856	27,000	788	1,765,120	65
1857	28,000	712	1,596,270	56
1858	29,000	629	1,408,960	48
1859	30,000	750	1,682,240	58
1860	31,443	821	1,839,040	58
1861	32,064	653	1,461,720	45
1862	32,704	703	1,574,720	48
1863	33,365	846	1,895,050	56
1864	34,064	1,014	2,271,360	66
1865	34,748	831	1,863,680	53
1866	35,469	1,205	2,699,200	76
1867	36,311	1,305	2,923,200	80
1868	36,973	1,431	3,205,440	86
1869	37,756	1,711	3,832,840	101
1870	38,558	1,665	3,729,600	96
1871	39,555	1,706	3,821,440	96
1872	40,596	2,548	5,817,520	143
1873	41,677	2,560	5,734,400	137
1874	42,996	2,401	5,378,240	125
1875	43,951	2,023	4,531,520	103
1876	45,137	1,868	4,184,320	93
1877	46,353	2,066	4,627,840	99
1878	47,598	2,301	5,154,240	108
1879	48,886	2,741	6,132,040	125
1880	50,156	3,835	8,590,400	171
1881	51,316	4,144	9,282,560	188
1882	52,495	4,623	10,355,520	197
1883	53,693	4,595	10,292,800	191
1884	54,911	4,097	9,167,280	166
1885	56,148	4,044	9,038,560	161
1886	57,404	5,683	12,729,940	221
1887	58,680	6,417	14,374,080	244
1888	59,974	6,489	14,535,360	242
1889	61,298	7,603	17,030,720	277
1890	62,948	9,202	20,612,480	327
1891	63,844	8,279	18,544,960	289
1892	65,086	9,157	20,511,680	315
1893	66,349	7,124	15,897,760	239
1894	67,632	6,657	14,911,680	220
1895	68,934	9,446	21,159,040	306
1896	70,254	8,623	19,315,520	274
1897	71,592	9,652	21,620,480	302
1898	72,947	11,773	26,371,520	361
1899	74,318	13,620	30,308,800	409
1900	75,995	13,789	30,887,360	406
1901	77,612	15,878	35,566,720	458
1902	79,231	17,821	39,919,040	504
1903	80,848	18,009	40,440,160	500
1904	82,467	16,497	38,053,280	462
1905	84,085	22,992	51,502,080	612
1906	85,702	25,307	56,687,680	661
1907	87,320	25,781	57,749,440	661
1908	88,939	15,936	35,696,640	400
1909	90,556	25,795	57,780,800	638
1910	92,174	27,303	61,158,720	663
1911	93,682	23,649	52,973,760	565
1912	95,097	29,726	66,586,240	700
1913	96,512	30,966	69,363,840	717
1914	97,927	23,332	52,263,680	533
1915	99,757	29,916	67,011,840	677
1916	100,757	39,434	88,332,160	876
1917	102,172	38,621	86,511,040	846
1918	103,787	39,054	87,480,960	843
1919	105,003	31,015	69,473,600	661
1920	106,418	36,926	82,714,240	777
1921	107,833	13,079	29,296,960	271

than that of pig iron, and the curtailment of operations below normal was slightly greater in pig iron and for ingots. By 1926 the normal production of pig iron, in accordance with the trend line, will be 45,000,000 gross tons and that of ingots 51,000,000 tons. The explanation of this fundamental change in production trends lies in the ascendency of the open-hearth method of steelmaking over the bessemer process. Under the bessemer process, pig iron is consumed exclusively, while in the present ranking method, scrap furnishes a large part of the melting materials. This is particularly true of the basic open-hearth method by which the bulk of the steel now made in this country is produced. The result is a much larger output of steel with a given production of pig iron.

Per Capita Increase Amazing

The story of the increase of the per capita consumption of steel during the last 20 years is the amazing story of the inventive genius and industrial progress which are responsible for the high standards of modern life. A study of the past record of per capita production proves that the increase has been in direct ratio to the advance of civilization.

It has been said that when the production of iron goes down the prosperity of the entire country declines with it. The 67-year record of pig iron production and the 43-year record for steel amply support this observation. As pictured in the accompanying chart, the curves of these records graphically reflect the ups and downs of economic prosperity, as well as reveal the steady evolution and expansion of the complicated industrial organization of the present day.

Even in the fifties the close relation of iron production to general conditions is apparent. The rising tide of prosperity which culminated in the crisis of 1857 is reflected in the growth of the per capita output of pig iron to the record levels of 60 pounds and 65 pounds in 1855 and 1856 respectively. Then came the depression and pig iron operations declined, bringing the per capita demand to 48 pounds in 1858.

Curiously enough, iron production continued low, measured against the population, in spite of the outbreak and prosecution of the civil war, until 1864. In that year, the belated stimulus of the war is reflected in a per capita output of 66 pounds, one pound more than the previous record in 1856. The real expansion in the industry, however, did not manifest itself until during the great period of railroad building and industrial activity which followed the civil war. This expansion continued until the devastating panic of 1873. In 1872 pig iron production attained its greatest height with 142 pounds per capita.

The slump of blast furnace operations resulting from the subsequent panic continued until 1879 when business began to revive with the resumption of specie payments. The remarkable industrial recovery which appeared in 1880 as a result, largely of the abundant American harvests and the crop failures abroad, caused pig iron output to leap upward to another new high level of 171 pounds per capita. Then followed an extended period of prosperity with blast furnace operations rising sharply until checked by the momentous financial and business disturbances of the nineties. It is noteworthy that the lowest point reached in per capita output in the depression during the seventies was 93 pounds in 1876. This figure was 50 per cent in excess of the high mark reached in any year prior to the close of the Civil war.

In the great era of expansion which marked the opening of the twentieth century, pig iron played an important part. The per capita output grew by leaps and bounds and by 1916 the high record for all time was reached with 876 pounds. This figure represented a gain of 1384 per cent over the 59 pounds produced in 1854.

Rise in the production of steel, measures the march of progress even more truthfully than does the growth of pig iron output.

In 1878 steel ingot output was only 34 pounds per capita. In 1892, it had grown to 169 pounds. Then came the crisis in business and output declined. Incipient recovery was apparent by 1895, however, and the moderate slump in 1896 appears as a breathing spell before the country entered upon what was destined to be the most extraordinary industrial development in its history. The expansion has been marked by occasional recessions, the most important of which was in 1908.

Present Output Lowest in Years

The reaction of that year reduced the per capita pig iron output to 480 pounds and of steel ingots to 353 pounds. How drastic the curtailment has been is strikingly revealed by the fact that the annual per capita output at the rate in June was only 271 and 307 pounds for pig iron and steel ingots respectively. The rate for steel output in June was the lowest since the 300 pounds per capita in 1900, and it was exceeded by the 320 pounds in 1899. The pig iron rate in June was the lowest since the 220 pounds per capita in 1894. This was despite the belief which once prevailed that the iron and steel had become stabilized in recent years.

The high per capita output 1916 to 1918 was due to the insatiable need for war material. In 1920 the large export demand contributed to the heavy operations of the mills. Exports are now declining and this factor is one cause of the smaller output of steel. When the world recovers from the present reaction, however, it must resume the task of repairing the wastes of war, as well as replacing the existing machinery as it deteriorates from wear and tear. Moreover the steel industry must be ready to supply the tools for the next forward movement of progress.

Competition for foreign markets will be keen, but the American iron and steel industry is amply equipped to hold its own in the international struggle. The expansion of the industry since 1914 is estimated at about 40 per cent, yet the growth of normal requirements has been such as to obsorb all of this greater capacity, where it is founded upon sound economic conditions. All fundamental considerations indicate that the industry merely now is experiencing one of its "pauper" days, and that the next business cycle should carry it forward again into a sustained period of healthy growth.

Warehousing of Iron and Steel in New York

(*Concluded from Page* 288)

been interesting, otherwise it could not have held one generation after another. Garret Abeel who was the son of David and Mary (Ducykinck) was born in New York, May 2, 1734. He with his brother-in-law established the firm of "Abeel & Byvanck," iron merchants. In 1784 the founder was succeeded by his son, Garret Byvanck Abeel. The next change which the company underwent was in 1804. This time a brother, John Abeel, became a member of the concern and the name was altered to read G. B. & J. Abeel. Twelve years later, in 1816 a further alteration took place when the business was thenceforth carried on as Abeel & Dunscomb. Separated by about a decade of years other changes took place when sons were taken into partnership and later when sons succeeded the father but during each interval the name of the family was the outstanding means of identification. John H. Abeel whose membership dated back to 1836 retired and the business was turned over to four sons. George, Alfred, John H., Jr., and Frederick. Previous to 1918 three of these men died. In 1918 John H. Abeel Jr., retired and Henry F. Abeel became the chief executive.

Changes Make Foundry More Efficient

(*Concluded from Page 295*)

All leads have been heavily insulated and a special rack with heavy insulators carries all wires at an unusual height from the floor. The main switch is located conveniently and cuts off the current back of the transformer in case of any trouble. An auxiliary safety switch within easy reach of the furnace operator can be used to operate the main cutout switch without necessity of entering the transformer room. Copper leads from transformer to the furnace pass through a subway from the transformer room to the furnace pit instead of being carried overhead, as is customary.

The furnace is equipped with three 6-inch graphite electrodes made up of lengths screwed together and fed continuously as they burn. On starting the furnace the electrodes are regulated by hand for about 10 minutes, until a puddle of liquid metal has been formed and from then on control is automatic through a specially devised regulating apparatus actuated by motors connected to the furnace. In connection with this device, hand wheels allow clamps to be loosened on the electrodes for adjustment in placing new electrodes. These clamps, holding the electrodes, are water cooled.

The furnace is charged by a bucket with a drop bottom which places the entire charge at one operation instead of its being shoveled through the side doors. This results in a great saving of time. Provision has been made for installation of a preheating device to use crude oil, which will bring the scrap to a red heat before it is placed in the furnace, thus greatly reducing the time of melting. Heats have required about 1½ hours in actual practice, but this has not been under pressure for time and probably could be shortened.

The capacity of this foundry is about 700 tons of completed castings per month. While the average weight is about 11 pounds, the work ranges from one ounce to 5000 pounds, although nothing heavier than 3000 pounds has been cast up to this time. In the foundry molds are made by air squeezers manufactured by the International Molding Machine Co., 2614 West Sixteenth street, Chicago, and by jolts for heavy floor work. The heavy machines were made by Henry E. Pridmore, Nineteenth and Rockwell streets, Chicago. The full length of the foundry and shipping room is 340 feet and three 5-ton cranes span it, one made by the Whiting Corp., Whiting, Ill., and the other two by the Northern Engineering Works, Detroit.

A laboratory has been provided with a tensile testing machine, coupons being cast from every heat and careful test being made for record. In the chemical laboratory various determinations of carbon and other constituents are made on each heat.

Only one test is taken before final pouring, unless some condition arises which makes it necessary to take a second. A test piece is cast and broken and the carbon is judged by the fracture to indicate the general condition of the steel. A laboratory analysis is then run before the metal is poured. The heat number is stamped on all castings for future identification.

By using delta or star connection voltage can be varied from 180 to 90 volts, the former being used for melting and the latter for refining. On the average the furnace is run at about 4500 amperes and 175 volts. The average consumption of current is 600 kilowatt hours per ton.

All additions of alloys are made in the furnace before the metal is poured and the entire refining process is completed there, the final condition of the metal being determined by testing before it is removed from the furnace instead of making additions of alloys in the ladle.

After being poured from the furnace the metal is taken by a crane direct to the molding floors. While the capacity of the furnace is 3½ tons, this is frequently exceeded by as much as one ton per heat. The process in this foundry is practically continuous in that molds are poured whenever the furnace is ready to discharge its heat and making of new molds continues meanwhile. As soon as the molds have cooled sufficiently they are dumped from the flasks into the dump cars and removed to the shakeout floor by the tractor system already mentioned.

The Chicago Steel Foundry was the first steel foundry in Chicago and has been in operation about 15 years. In that period it never has been shut down three consecutive days, except when Saturday and Monday holidays occurred.

Reports on Waste in Building Industry

HALF a billion dollars a year in wages is being lost in the building industry through unemployment, it is asserted in a report made public by the committee on elimination of waste in industry of the American Engineering council, appointed by Herbert Hoover. Lack of work is declared to be the outstanding fact in this industry, whose critical condition following the war is attributed primarily to high costs of construction.

Waste, it is said, is causing huge losses in building which, including all trades and common labor incidental to it, ranks second among the industries and contributes to the wealth of the nation more than $3,000,000,000 yearly. Yearly averages for the past six years show that 32 per cent of the activities of the industry, which employs some 3,000,000 mechanics and laborers in a single year, are devoted to residential buildings and 18 per cent to industrial buildings.

According to the report, the chief sources of waste in the building industry are irregular employment, inefficient management, and wasteful labor regulations. Customs or conditions prevailing throughout the industry, and poorly designed equipment are given as secondary causes.

The committee's investigation covered the entire country, special attention, the report says, being paid to representative cities such as New York, Boston, Philadelphia, Baltimore, Chicago, Cleveland, Atlanta and San Francisco.

"The building trade workman," asserts the report, "is busy on the average about 190 days in the year, or two-thirds of his time.

"Union regulations in the past have produced enormous losses through direct or indirect restriction of output. Workmen and contractors, however, are beginning to appreciate that reduced output reacts in tremendous fashion upon themselves.

"Greater co-operation between the workmen and the employers is an absolute essential. This co-operation must be attained before we can approach the elimination of labor difficulties. Such co-operation, however, is impossible without the removal of causes of friction and the working out of plans to this end.

"A striking fact about the building industry is that inasmuch as small buildings require so little capital or credit, and apparently so little technical ability, the field is full of small contractors, many of whom operate for a few years and then fail. In Cleveland, for example, out of 4000 contractors

perhaps not more than 400 are needed for ordinary requirements.

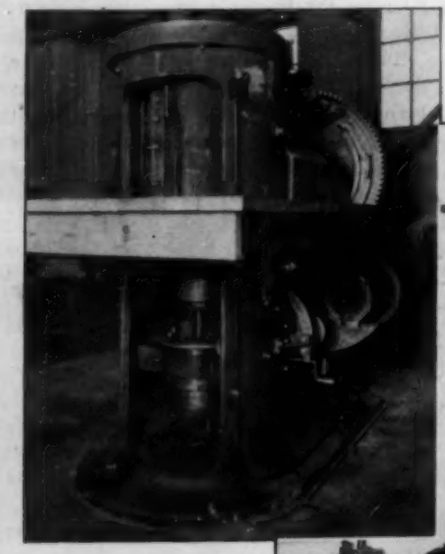
The total shortage of housing in 1921, it is found, amounts to 53 per cent of the total square footage (called the real measure of value) constructed in 1915. "To this percentage must be added," the reports continues, "if we consider the footage constructed in 1915 as equal to the requirements of that year, seven and one-half per cent which represents the increment required to cover the increase in population as it changes perceptibly from year to year.

For some time the United States bureau of standards has been conducting an investigation of stresses in cast iron and rolled steel railroad wheels. With the aid of the results obtained from tensile tests on material taken from the wheels and thermal expansion data obtained on similar materials, computations have been made of the stresses set up by heating the tread of various steel wheels. It was found that the stresses on the outside of the wheel were in compression near the tread and in tension near the hub, the maximum value in each case being greater than the proportional limit of the material. This distribution is similar to that previously found in the single plate cast iron wheel. To analyze further the stress distribution in the wheels, some of them are being prepared so stress measurements can be taken on the back and circumferential directions.

Shaper Cuts Gear Teeth Simultaneously

FOR cutting teeth or grooves in all cylindrical products such as gears, sprockets, splined shafts, reamers, taps, milling cutters, saws, ratchets and knitting machine rolls, a new multiple shaper has been developed which cuts all or a multiple number of teeth in a product at one operation. This machine, which is manufactured by the Stevenson Gear Co., Indianapolis, operates the same as a vertical shaper except that the tools are held stationary and the piece being machined is reciprocated past the tools. The essential members of the shaper are a special tool head, containing a series of radially disposed cutting tools spaced about the circumference of the blank to be cut, and a ram supporting the arbor carrying the blank which passes through the center of the head. A casting of rectangular box section with a cylindrical hollow column 7 feet high at one end forms the machine frame, as may be seen from Figs. 1 and 2. Mounted in the center of this column is the ram while the tool head is bolted to the top of the column.

Drive to the ram is through a crankshaft and back gears direct connected to a 100-horsepower motor. An arbor mounted on the ram carries the gear blank and is indexed after each cutting stroke by an intermittent gear train. By varying the ratio of the change gears in the train, indexing movement for any desired number of teeth may be obtained. Angular adjustments of one second are possible. The main crankshaft is connected to the large back gear by a quick return crank which imparts a slow motion to the ram during the cutting stroke and a quickly accelerated motion for the return. Mounted on a sliding base, the motor drives through a sin-



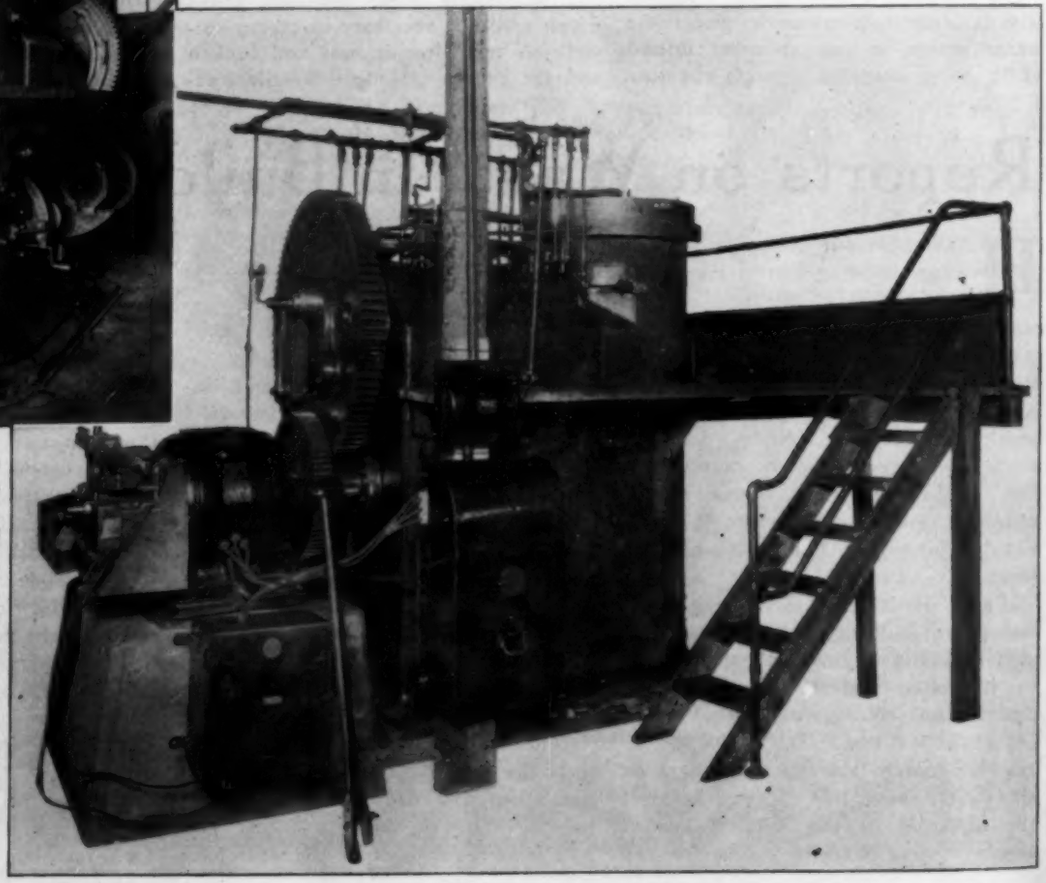


Fig. 1—The Ram, on Top of Which is Mounted the Special Tool Head. Indexing of the Head Is Accomplished by the Internal Gear. Fig. 2—Front View of Multiple Gear Shaper Showing Motor Drive, Control Equipment and Gearing to Vertical Ram Inclosed in the Cylindrical Portion of the Machine to the Right

Fig. 3—Feed and Clamping Mechanism as Seen from Above. The Ring to the Front is the Top of the Ram Housing with Lugs for Holding Head.

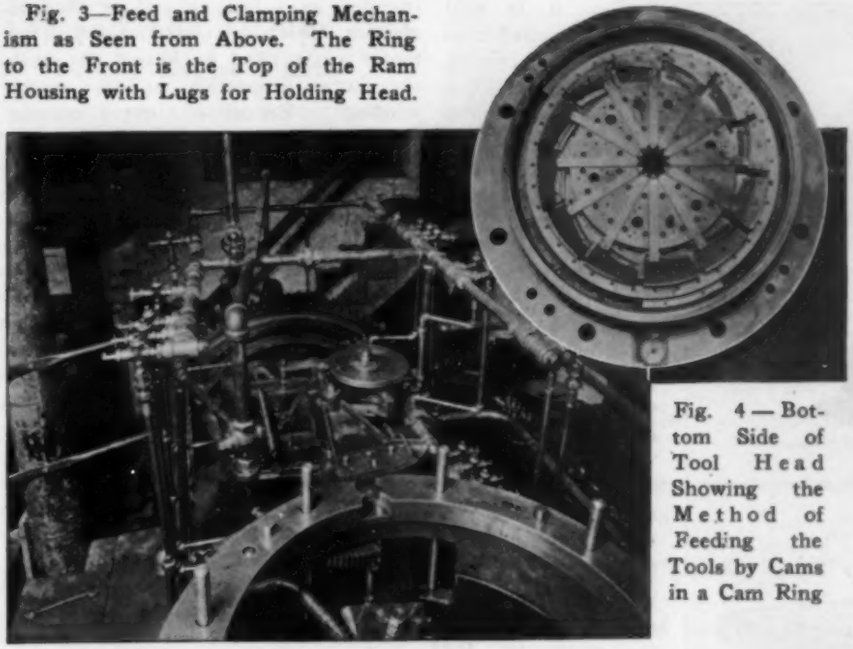


Fig. 4 — Bottom Side of Tool Head Showing the Method of Feeding the Tools by Cams in a Cam Ring

gle set of speed change back gears, the drive for the indexing mechanism being taken directly from these gears. A pump for circulating cutting oil is actuated from a small sprocket on the end of the motor shaft opposite the driving pinion. As shown in Fig. 2, the motor is controlled by a push button switch, automatic compensator and solenoid electric brake.

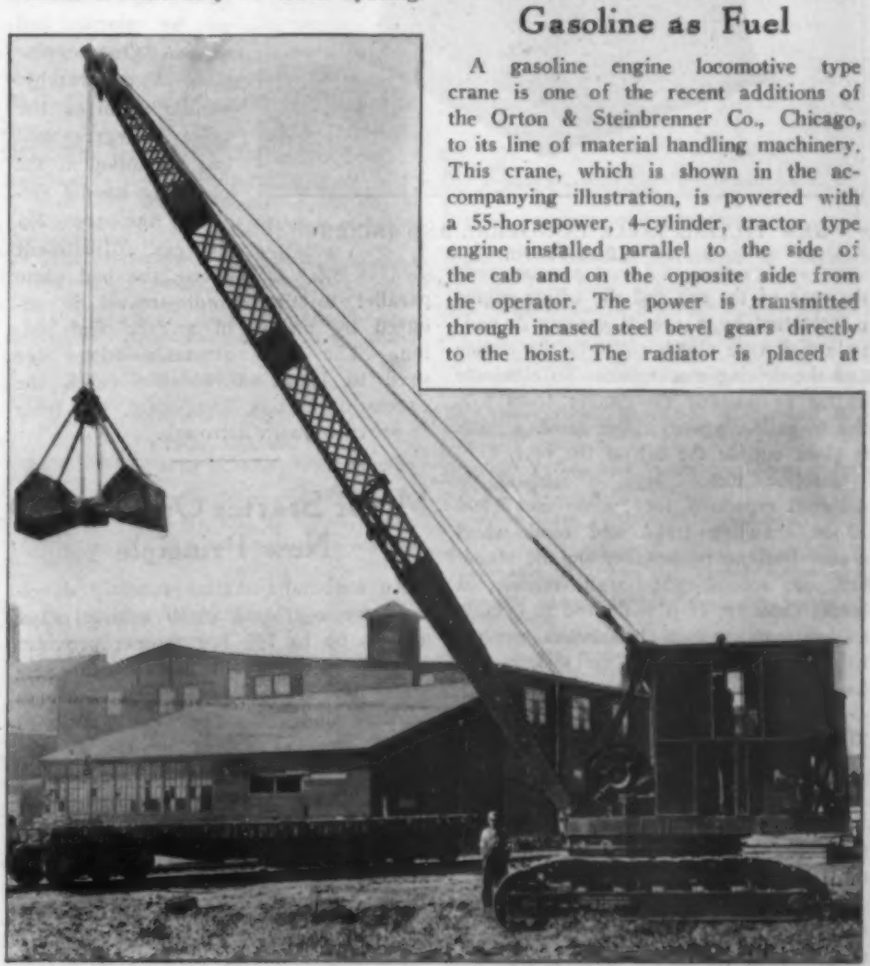
Gears to be cut are loaded into the work arbor, while the arbor is held in a vise-like fixture attached to a bench at the side of the machine and is then placed on the machine by dropping the arbor into the taper socket of the ram spindle. By this method, while one arbor of gears is passing through the cutters, another arbor is being loaded with blanks. Arbors are removed from the machine by stepping on a foot pedal which operates a kick-out bar passing through the center of the ram spindle. It is said that unloading and loading of the shaper requires but a few seconds.

One of the main elements of the machine is the tool head which consists principally of a flat steel disk 3 feet in diameter provided with a hole at the center and a number of radial grooves cut in its face in which the tool bits are arranged like the spokes of a wheel. Fig. 4 shows the underneath side of this head. Successive feeding movements are imparted to the tools by an annular sectional cam ring. As the gear blank is reciprocated past the cutting tools, the tools are fed in gradually upon each cut to the full depth of the tooth. At the completion of each stroke of the ram, the gear blank is indexed a space equal to one tooth, thereby presenting a different tool to each tooth on each cut. After the full depth cut has been made, the tools are held stationary while the cutting process continues until the gear has indexed one complete revolution. This final index insures a uniformity of tooth spacing.

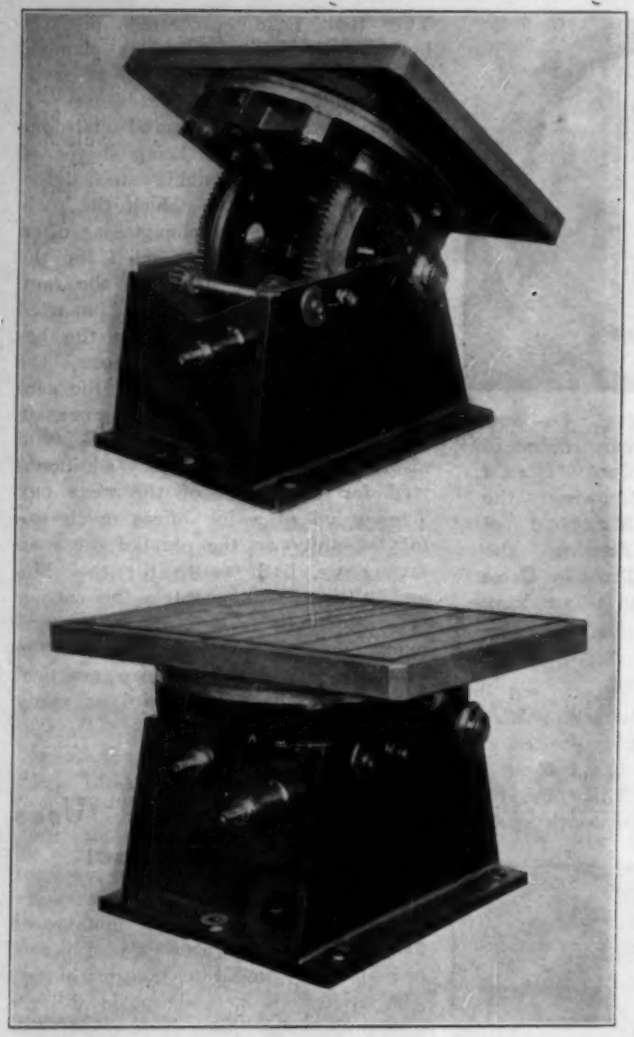
The tool head, protected on the bottom side by a cover, is clamped on to the ram column by eight studs shown in Fig. 3. Two heads are provided with each machine and while one is in use, the other is being sharpened or re-set. An adjustable stop determines the final depth which the tools will cut and may be changed as often as desired. To provide relief for the tools on the back stroke of the ram, a reverse feeding motion is imparted to the cam ring and before the beginning of the cutting stroke, the forward feeding movement of the cam is made great enough to compensate for the slight retraction for relief and also to provide the necessary additional feed for the depth of the next cut. Tooling up of a job offers much use for ingenuity on the part of the man setting up, both as to the tool bits and their arrangement. In cutting some gears, it is desirable to use as many tools as there are teeth in the gear; in others it is more practical to use only half or a third as many tools as there are teeth.

Locomotive Crane Uses Gasoline as Fuel

A gasoline engine locomotive type crane is one of the recent additions of the Orton & Steinbrenner Co., Chicago, to its line of material handling machinery. This crane, which is shown in the accompanying illustration, is powered with a 55-horsepower, 4-cylinder, tractor type engine installed parallel to the side of the cab and on the opposite side from the operator. The power is transmitted through incased steel bevel gears directly to the hoist. The radiator is placed at



CATERPILLAR TRACTOR CRANE WHICH IS OPERATED BY A 55-HORSEPOWER GASOLINE ENGINE



NEW TILTING TABLE IN NORMAL AND INCLINED POSITIONS

the rear of the cab and the whole engine is protected by a special casing. A multiple disk type clutch connects the engine and the driving mechanisms. To eliminate as far as possible the danger from fire, the 60-gallon gravity feed gasoline tank is place outside the cab at the rear.

Gasoline motor type of power is designed especially for use on the 7 and 12-ton crawling tread and road wheel cranes but can be installed on the standard or special gage rail cranes of larger capacity. If it is desired to operate an electromagnet, a belt-driven generating set for energizing the magnet can be direct connected to the engine.

Builds Universal Tilting and Rotary Table

For increasing machine shop production, a new universal tilting and rotary table for use with floor type boring, drilling and milling machines recently has been placed on the market by the Pawling & Harnischfeger Co., Milwaukee. With this accessory, which is shown in the accompanying illustration, it is said that it is possible to carry on machining operations on five sides of a piece and at any angle with but one setup. The lower part of the illustration shows the table in its normal position while the illustration above shows it tilted in one of its positions. It has an elevation of 90 degrees and can be revolved a complete 360 degrees at any position, flat or elevated. A graduated dial is conveniently placed to enable the operator to locate the work on the table accurately. Elevation of the table top is accomplished by means of two coarse-pitch spur gear segments driven by worm and pinion. One revolution of the ratchet handle revolves the table 30 degrees and one revolution of the elevating handle elevates the top 2½ degrees. Adjustment along the bed plate parallel to the spindle travel is secured by means of a rack and pinion. The slots or table edges are used to locate work. To catch the excess of cutting compound, the table is provided with a trough.

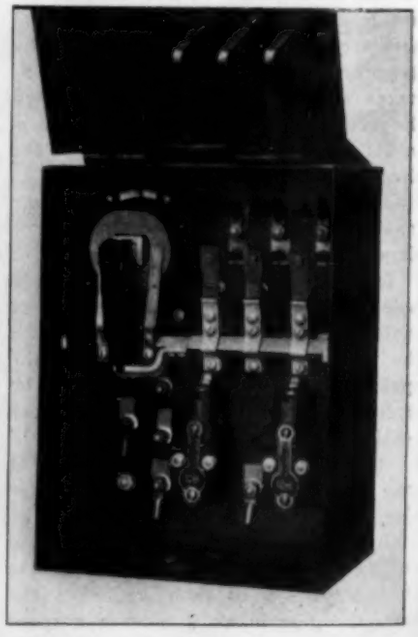
Motor Starter Operates on New Principle

An automatic starter recently developed for operating small squirrel cage motors up to 7½ horsepower provides for a large current for several seconds but at the same time prevents burnout dangers. The new feature of the starter, as shown by the accompanying illustration, is the use of two mercury overload relays mounted below the contact fingers. They eliminate fuse troubles and allow overloads as high as 25 per cent for a limited period. The new relay consists of a glass tube carrying a mercury column which forms a part of the pilot circuit of the magnetic switch coil.

A portion of this column is surrounded by a heating coil or thermal element which is in series with the motor circuit and is heated in much the same proportion as the motor windings. Excessive current passing for too long a period heats the coil, causes the mercury to boil and the vapor to pass up into a chamber at the top of the tube. This action breaks the liquid mercury column and opens the circuit to the magnet coil and as the coil is de-energized, the contact fingers drop away and disconnect the motor from the line. After such an interruption, the mercury condenses to a liquid so that the pilot circuit to the magnet coil is complete when the control button is depressed.

As the functioning of these overload relays depend upon the temperature at which mercury will boil, it is evident that the current required to operate the relay increases with the decrease in the temperature of the surrounding air. In other words, if the motor and starter are installed in a cool location, the relay permits a higher overload than if the temperature of the surrounding air was higher. The opposite is true if the motor and starter are installed in a hot place. The push button station can be installed in any position convenient for the operator. The new starter is manufactured by the Cutler-Hammer Mfg. Co., Milwaukee.

Pennsylvania farmers use more gas engines now than a year ago. The state department of agriculture reports 34 per cent now as against 28 per cent 12 months ago. Forty per cent use cream separators.



MERCURY OVERLOAD RELAYS ARE EMPLOYED IN THIS STARTER

Tap and Die Holder Has Only Eight Parts

A clutch tap and die holder recently developed by the Warner & Swasey Co., Cleveland, is made of eight parts as compared with 23 parts in an earlier model made by the company. It is claimed that the new type incorporates all the principles found in the older type. This new appliance, which is shown in Fig. 1, holds either right or lefthand dies or taps. To change from right to left, a small tightening screw is released by a screwdriver and the rest of the adjustment is made quickly by hand. This adjustment consists in changing the position of a pawl by turning it 180 degrees in its seat where it is held in place by a small

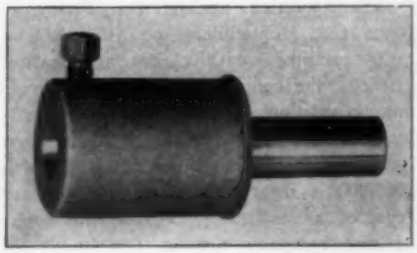


FIG. 1—NEW CLUTCH TAP AND DIE HOLDER

pin. In Fig. 2 are shown the eight parts which compose the new holder. Each is placed in its relative position preparatory to assembly. Fig. 1 shows the holder assembled.

When threading, the pawl holds the tool rigid by a metal to metal contact until the turret stop is reached. Then the head moves forward on the work and pulls the cam over the pawl which releases the head and allows it to revolve freely. The coil spring cushions the pawl so that the release is without jar and almost noiseless. Each part of the holder has been carefully selected and heat treated. Because of its simplicity, the tool is easily cleaned, oiled and kept in condition.

Pig Iron Output Gains

According to a bulletin of the United States department of commerce production of pig iron in New South Wales has increased in 1920. The total was 26,096 tons which represented an increase of 5155 tons compared with 1919. In addition to the quantity of iron ore required to produce the pig iron 2881 tons were mined and used by smelting companies for fluxing purposes. Iron oxide production showed a decline, the output being 1574 tons compared with 2724 tons for 1919. The product is used as a pigment by gas companies for purifying purposes.

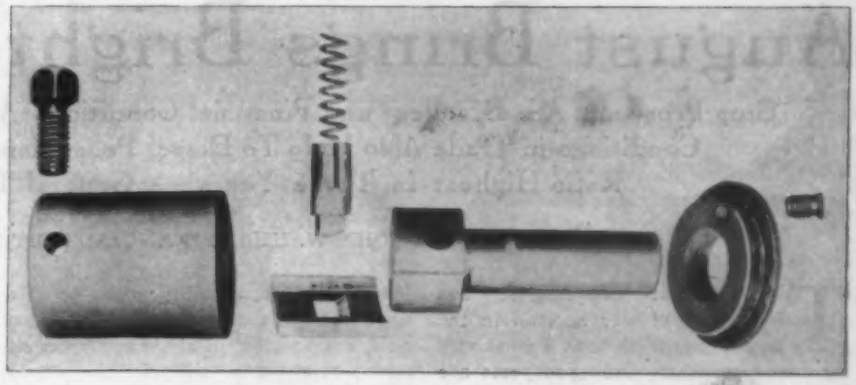


FIG. 2—PARTS OF THE TAP AND DIE HOLDER SHOWN IN THEIR RELATIVE POSITIONS

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

MEETINGS of the metal branch, small tool group and the exhibition of automobile accessories are features of interest to the iron and steel industry in the program for the twenty-seventh annual convention of the National Hardware association to be held at the Marlborough-Blenheim hotel, Atlantic City, N. J., Oct. 17 to 22. The complete tentative program follows:

Monday, Oct. 17

10:00 a. m. to 5:00 p. m.—Meeting of executive committee.
8:00 p. m.—Opening session.

Tuesday, Oct. 18

10:15 a. m.—Executive session.
2:15 p. m.—Meetings of, metal branch, small tool group, housefurnishing hardware group, builder's hardware group.

Wednesday, Oct. 19

10:15 a. m.—Executive session.
2:15 p. m.—Executive session.

Thursday, Oct. 20

10:00 a. m.—Meeting of automobile accessories branch.
12:00 m.—Automobile accessories exhibit.

Saturday, Oct. 22

9:30 a. m. to 1:00 p. m.—Automobile accessories exhibit.

* * *

To Co-operate With War Department

To speed the government's postwar program for ordnance development, the ordnance division of the American Society of Mechanical Engineers is planning to work with the war department in the solution of engineering and production problems. A joint meeting will be held Oct. 7 between the American Society of Mechanical Engineers, the Society of Aeronautic Engineers and the Army Ordnance association at the Aberdeen proving grounds. Waldo H. Marshall of the T. A. Gillespie Co. is chairman of the executive committee of the division. Other members of the committee are: Col. C. L. H. Ruggles, ordnance department, United States; Fred J. Miller, past president, of the American Society of Mechanical Engineers; Lieut. Col. George L. Wall, Watertown, Mass.; Maj. Wilford J. Hawkins, Bloomfield, N. J.; and Maj. Edward L. Sherwood, Hoholius, N. J.

Convention Calendar

Aug. 11-13—National Association of Pattern Manufacturers, annual convention to be held at the Astor hotel, Milwaukee.

Sept. 6-10—American Chemical society, the Society of Chemical Industry and the American section of the latter organization will hold a joint meeting in New York. Charles L. Parsons, P. O. Box 1505, Washington, is secretary of the first mentioned society.

Sept. 12—National Exposition of Chemical Industries, in the Eighth Coast Artillery armory, New York.

Sept. 12-17 American Institute of Mining and Metallurgical Engineers, will hold its fall meeting at Wilkes-Barre, Pa. Bradley Stoughton, 29 West Thirty-ninth street, New York, is secretary.

Sept. 14-16—National Association of Cost Accountants, will hold its annual convention at the Cleveland hotel, Cleveland. The secretary's address is 233 Woolworth building, New York.

Sept. 19-24—American Society for Steel Treating. Annual convention and exhibition at the Manufacturers building, state fair grounds, Indianapolis. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Sept. 29-Oct. 1—American Electrochemical society, fall meeting, Lake Placid, N. Y. Joseph W. Richards, Lehigh university, Lehigh, Pa., is secretary.

Oct. 5-7—Society of Industrial Engineers will hold fall meeting at Springfield, Mass.

Oct. 17-22—American Mining Congress, will hold its twenty-fourth annual convention in the Coliseum, Chicago. Also national exposition of mines and mining equipment.

Oct. 17-22—National Hardware Association of the United States will hold twenty-seventh annual convention at the Marlborough-Blenheim hotel, Atlantic City. T. James Fernley, 120-24 High street, Boston, is secretary.

Dec. 1-3—Taylor society, fall meeting, New York. Harlow S. Pearson, 29 West Thirty-ninth street, New York, is secretary.

August Brings Brighter Outlook

Crop Prospects Are Excellent and Financial Conditions Are Improving — Bettering Conditions in Trade Also Help To Dispel Pessimism — Reserve System Ratio Highest in Three Years — General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

THE advent of August has brought a clearer horizon in the business outlook than has existed for many months. Crop prospects are excellent, farmers are selling in volume and liquidating their loans, the general financial situation is greatly improved, and the immediate credit problems of the railroad are apparently near solution. Add to these factors tangible evidence of bettering trade conditions in a number of lines and it is not strange that underlying business sentiment. is distinctly more cheerful.

Other developments which have appeared to counteract the recent wave of pessimism have included, the postponement of the soldiers' bonus bill; the pushing forward of the revenue measure; the evident intention of the senate not to pass a tariff bill which would prevent Europe from paying its debts and shut off export markets for Americans; and the successful progress of plans for the disarmament conference.

Of outstanding importance has been the improvement in financial conditions. One year ago the low reserves of the federal reserve system and the fear of a financial collapse when crop moving demands appeared was the blackest cloud upon the business skies. Now the federal reserve ratio stands at 63.4 per cent, the highest point in more than three years.

A chief factor in increasing banking strength has been the heavy gold imports. Since the beginning of the current year, the reserve system's holdings in gold have increased approximately $450,000,000 or 22 per cent. Other causes of the advancing reserves, however, have been the diminishing demand for credit due to trade dullness, together with the gradual liquidation of frozen loans.

Credit Has Been Deflated

Since Jan. 1 the total of rediscounts has decreased $1,250,000 or 43 per cent and notes in circulation have gone down $700,000,000 or nearly 22 per cent. This shows that the improvement has come from the deflation in credit as well as from the inflow of gold. To the extent that the lower reserve bank rates are due to the gold inflation alone there is an element of danger. Were rates to be artificially lowered, and commodity prices boosted, upon the basis of the heavy surplus of gold temporarily in this country a situation might arise whereby the outside world would make a drive to win back their gold. Heavy gold exports would remove the foundations for such inflation.

On the whole, however, conditions normally are ripe for lower bank loan rates and these are expected to appear soon. Last week witnessed call money on Wall street as low as 3½ per cent, something unknown in many months. Many business men have been puzzled because of the continued difficulty of obtaining loans, in view of the high reserve ratios and the well known lessened demand for credit for business requirements.

Credit, of course, is no longer tight in the sense that was true some months ago, yet many banks are pursuing an extremely cautious policy in doling out loans. There is considerable credit frozen in export loans, in unmoved commodities and in carrying borrowers over the present crisis. In addition, the investment market is competing for funds and government requirements are absorbing large amounts also. Banks, moreover, are endeavoring to get their reserves in good condition and reduce their borrowings at the federal reserve system as much as possible. This tendency is helping to increase the reserve ratio.

But underlying all of these considerations is the fundamental reluctance of bankers to loan funds while commodity markets are declining. Liquidation is complete for many basic raw materials, but bankers feel that some manufactured products together with industrial wages have to face further deflation. They hestitate, therefore, to encourage jobbers and retailers to load up with merchandise now. Nor do they consider that the liquidation of the credit structure has gone sufficiently far. In other words the banks are unwilling to assume great risks now. Like everyone else they entered into the spirit of the period of inflation and scattered credit broadcast when prices were rising and business was booming. But now many of them have taken their losses along with the rest of the business community and they are inclined to play a waiting game until conditions become more stabilized and the outlook more certain. Then they will loosen the credit strings and money rates will recede. That time now seems near at hand.

Pusey & Jones Co. Files Voluntary Petition

Following the petition in involuntary bankruptcy filed against the Pusey & Jones Co., shipbuilders, on July 19, by three creditors with claims aggregating $100,242, the company July 26 filed a voluntary petition in bankruptcy. According to this new petition, the known liabilities amount to $1,799,000, of which $950,000 is secured. Other liabilities are reported as unknown, because the books of the company are in the hands of Joseph P. Tumulty, the receiver appointed by the court in Delaware, who is acting with Henry A. Wise, the receiver appointed in the New York jurisdiction.

Before the completion of a reorganization begun by Mr. Wise and others early in the year, Karluf Hanssen, a Norwegian with a claim of $650,000 obtained from the court in Delaware in June the appointment of two receivers, Willard Saulsbury and Charles B. Evans. They sought to clear up some of the confusion in the company's affairs by filing with the court a petition asking for the dismissal of the petition of July 19, when Mr. Wise was named receiver.

The company's petition says that the Baltimore Dry Docks & Shipbuilding Co., Baltimore, holds a judgment against the bankrupt's property for $800,000, which acts as a lien on the property. David Blair, Camden, N. J., it also says, holds a mortgage against the property at Gloucester for $150,000. Among the unsecured creditors appears the name of Mr. Hanssen, whose claim is disputed.

Bethlehem Head States Low Point Passed

Directors of the Bethlehem Steel Corp. last week voted the usual quarterly dividends of 1¼ per cent on both its class A and class B common stock and immediately after the meeting at

which the dividends were declared, Eugene G. Grace, president of the company, said the dividends had been more than earned in the last quarter as well as the full first half of the year. The dividends will be paid Oct. 1 to stock of record Sept. 15.

Actual earnings of the corporation, as might be disclosed in a detailed financial report, were not made public, but President Grace said the value of orders on the books June 30 was $84,000,000 as against $110,000,000 at the end of the first quarter. He pointed out that while the new business booked during the last quarter was $26,000,000 less than the shipments, it showed an increase over the bookings of the first quarter.

Mr. Grace declared this indicated the low point has been turned and that an increase in business is to be expected. Just as soon as the railroads are in position to buy, he said, a definite and substantial improvement may be noted in the steel industry. He also said the steel industry had done its share in liquidating values to a point where business should go forward, especially as steel prices relatively are at the lowest point in 20 years.

Otis Steel Seeks Loan

The Otis Steel Co., Cleveland, has asked authority of its stockholders to issue $15,000,000 of 30-year 8 per cent first mortgage bonds, $5,000,000 of which would be sold at once. The other $10,000,000 would be held for future requirements. Stockholders are expected to meet shortly to act upon the request. Negotiations now are under way for the disposition of the bonds in case the authority is granted.

Creditors Extend Time

A majority of the creditors of the Midwest Engine Co., Indianapolis, have granted an extension of credit for two years dating from June 27. The claims thus extended represent 90 per cent of the total face value. The extension was asked because the industrial depression has made it difficult for the company to liquidate its inventory. A creditors' committee consisting of five men has been appointed and it will co-operate with the management in the conduct of the company's affairs.

Northern Ore Has Deficit

Total receipts of $5,952,816 for the year ended Dec. 31, 1920, are reported by the Great Northern Ore Properties. The amount paid out in dividends was $6,000,000. Disbursements, including $97,960 for administration, were $145,144 more than receipts. Receipts in 1919 amounted to $5,844,249 and expenses, including dividends, $6,093,617. Disbursements exceeded receipts in 1918 by $1,477,497, and in 1917 by $2,260,408. At the close of business in 1920 the company had undistributed receipts of $208,000.

Millions Are Wasted in Labor Turnover

IDLE men and machinery are causing an annual loss of nearly a billion dollars a year in the metal trades industry, says a report issued by the committee on elimination of waste in industry of the American Engineering council. This estimate covers the value of labor only and does not include the value of materials that would be utilized if the productivity of labor were increased. It is estimated that the value of increased possible production in the United States even in normal times would be over half a billion dollars.

"There are nearly two million people engaged in the establishments of the metal trades industry," says the report, "and an enormous increase in total production is possible. It is estimated that at present about 80 per cent of the responsibility for waste, or nonproduction, rests with the managers and executives in the plants."

The estimated waste in 15 representative plants selected by the committee averages 28 per cent for all and ranges from 8 per cent waste for the best plant to 56 per cent for the worst. The size of the plant, whether large, medium or small, does not necessarily affect its efficiency, as some large plants as well as some small ones have a large waste factor, it is stated. The metalmaking branch of the industry which produces plates, shapes, wire, etc., is not included in the survey.

The major causes of waste or nonproduction, applicable to normal times as well as to the present abnormal times, is attributed to instability of labor employment and inefficient management. In most of the plants surveyed little thought is given to the instability of labor employment. The report continues:

"The proper relationship between management and labor, such as exist in the most productive plants investigated, is more than ever a controlling factor. The plants with the highest labor turnover which reflects discontent) in general are the most wasteful of human effort; hence secure the smallest production per man hour. It is found further that generally the best relationship exists and the best understanding and less friction prevail in plants where the most thorough and scientific study of organization methods and standards have been made by the management in co-operation with the workers.

"The careful planning of work, the providing and the moving of materials by means of effective and recognized methods of material control; comparison of output of departments and of individuals with fair standards of performance, fairly and scientifically determined; these are the practices of those concerns which have been most free from labor unrest.

"The provision by the management of proper facilities and convenience for developing the latent productivity of the workers and the provision of fair incentives for those who 'make good' play a large part in eliminating waste in the best establishments.

"It is shown by experience of the plants visited that considerable improvement can be brought about by means of modern employment methods, which provide, among other features for a close study of 'why men quit.'"

Dealing with the cost of labor turnover, the report says:

"The average labor turnover for the year 1920, for the plants covered by these studies wherever records were kept, which was the case in less than half of the plants), was 160 per cent, the percentage given in most cases being the ratio between the number of separations and the average number on the payroll. The highest turnover was 366 per cent.

"There is a practical minimum to the labor turnover in a shop or factory, which cannot be excelled in special cases. There are separations that are unavoidable, due to deaths, marriages, etc., for which 60 per cent may be allowed which still leaves an avoidable or preventable turnover of 100 per cent annually.

"In this industry, then, with its two million employees, with the average plant virtually renewing its entire working force, or filling each position, one-and-a-half times a year, we have two million unnecessary separations, the equivalent of two million workers annually separated and re-hired somewhere, and at what cost? Expert estimates of the cost of labor turnover vary from $50 to $250 per employee hired, trained and separated. An average figure of only $50 each applied to two million employes 'turned-over,' means an average waste of one hundred million dollars due to avoidable labor turnover.

"Instability of labor employment resulting from strikes and lockouts has not been as serious in the metal trades industry as in some other industries, with the exception of the shipbuilding branch of this industry."

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

CHARLES J. HUNTER, vice president and treasurer of the Wheeling Steel & Iron Co., Wheeling, W. Va., has been elected president of the company succeeding John Duncan, who resigned, effective Aug. 1, to become actively associated with the Illinois Co., St. Louis, owner of coal, coke, iron and railroad properties in southern Illinois. Mr. Hunter, 50 years old July 26, has been associated with the Wheeling Steel & Iron Co. since he was 19 years old. Upon graduation from high school, he entered the service of the Benwood Iron Works. Alonzo Loring at that time was president of the company. Mr. Hunter continued with the company following the merger of the Benwood Iron Works, Wheeling Iron & Nail Co. and Belmont Nail Co. in 1892. He advanced from the position of office boy to that of invoice clerk, then to paymaster, bookkeeper and purchasing agent, which position he held for a period of 13 years. He then became secretary and treasurer and finally vice president. Mr. Hunter is the fourth president of the Wheeling Steel & Iron Co. C. R. Hubbard was its first president and upon his resignation I. M. Scott was chosen to fill the vacancy. A year ago following the merger of the Wheeling Steel & Iron Co., Whitaker-Glessner Co. and the La Belle Iron Co. as the Wheeling Steel Corp., Mr. Scott was elected president of the corporation and Mr. Duncan succeeded him as president of the Wheeling Steel & Iron Co.

I. W. Hawes of the New Britain Machine Co., New Britain, Conn., has returned from a nine months' trip to Europe.

Fuller F. Barnes, treasurer of the Wallace Barnes Co., Bristol, Conn., has been elected president of the Bristol Hospital, Inc.

Fred W. Pearce has been appointed temporary receiver for the Ingersoll Engineering Co., Bridgeport, Conn.

Bartholomew Scannell of the Scannell Boiler Works, Lowell, Mass., has been elected treasurer of the Harvard Co., recently incorporated in that city.

F. A. Hastings has been appointed assistant sales manager of the Pittsburgh Bridge & Iron Works, Rochester, Pa. Mr. Hastings formerly was with the American Bridge Co.

Robert S. Hammond, who has been district manager at Pittsburgh for the Whiting Corp., Chicago, for a number of years, has been transferred to Chicago.

Lucius E. Whiton, secretary and treasurer of the D. E. Whiton Machine Co., New London, Conn., sailed from New York July 30 for a five weeks' trip to England and France.

GEORGE E. HARRIS

George H. Kennedy, formerly with the William Tod works at Youngstown, O., has been appointed instructor of machine shop practice in the Kamehameha school, Honolulu.

N. C. Vestal, formerly manager of the Northwest Trading Co., has been made manager of a branch office opened in Seattle by the Andrew Carrigan Co., Rialto building, San Francisco.

Charles N. Holdredge, for the past 15 years assistant superintendent of the Hemphill Mfg. Co., Central Falls, R. I., builder of machinery has resigned to enter business.

John L. Key, Call Building, San Francisco, has been appointed Pacific coast representative for Forges de la Province, Societe Anonyme, Marchienne-au-pont, Belgium, steel manufacturer and exporter.

Morris Ferer, formerly a member of the firm of Aaron Ferer & Sons St. Louis, has been made general manager for Abe Feinberg, Muncie, Ind., dealer in scrap iron, steel and metals.

Frank S. Spencer, 1265 Boylston street, Boston, has been appointed representative in the New England district for the sale of variable section rolled products made by the Witherow Steel Co., Pittsburgh.

Lucius Wainwright, head of the Diamond Chain & Mfg. Co., Indianapolis, has been named second vice president of the Indianapolis Morris Plan Co., which is to establish a Morris Plan bank in Indianapolis.

Walter H. Scales, who formerly was chief designer for the Lackawanna Bridge Co., Buffalo, and a graduate of the University of Illinois, has established an engineering and architectural business in Indianapolis.

William L. Urquhart, export manager for the Hart & Hegeman Mfg. Co., Hartford, Conn., has been appointed British vice consul for the port of Hartford. He is the first British vice consul in any Connecticut city. Mr. Urquhart will retain his position with the Hart & Hegeman company.

George E. Harris, who resigned recently as general manager of sales of the Falcon Steel Co., Niles, O., to engage in steel sales in Detroit, has been connected with the industry for 30 years. His career began as a water boy in the Pacific Rolling Mills, San Francisco, which his father helped organize. After several years in the operating end of the business he became superintendent of A. Finkle Sons, Chicago, and before entering the selling end was division superintendent of the Nova Scotia Steel & Coal Co. His sales work began with the Peter A. Frasse Co., Buffalo, and later he was director of sales for the Hawkridge Bros. Co., Boston. During the war Mr. Harris was an approval officer in the finance department of the air service and was stationed at Buffalo. He resigned from the Hawkridge company to join the Falcon company.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WALTER H. Rastall, who has been selected by Secretary of Commerce Hoover to head the new division of heavy machinery in the bureau of foreign and domestic commerce, has been making for the bureau a most exhaustive investigation of the market in the Far East for American industrial machinery. In a report he is about to prepare, Mr. Rastall will give American machinery makers the benefit of his investigation which took him to every important port in Asia from Karachi and Bombay to Yokahama, the Philippines, Dutch Eeast Indies and Ceylo This trip, the second for Mr. Rastall in his 41 years, was begun in October, 1918, when the department of commerce took him from the bureau of aircraft production. From March, 1917, until October, 1918, Mr. Rastall was in charge of production for the Dayton, O., district, which included aircraft plants between Buffalo and Kansas City. Mr. Rastall's preparatory education was received in the Chicago schools, the Chicago English high school and Hebron Academy, Hebron, Me. After three years at the University of Maine in civil engineering with electrical engineering electives, he spent two years at Cornell university, this time specializing in mechanical engineering but still with electrical electives. He received the degree of mechanical engineer from Cornell in 1904. Previous to graduation he had had the practical experience of being a marine draftsman for the Bath Iron Works, Bath, Me., and the Eastern Shipbuilding Co., New London, Conn. At the Melrose Park, Ill., plant of the Latrobe Steel & Coupler Co. he was chief draftsman. From 1904 to 1911 Mr. Rastall was resident engineer at Kobe, Japan, for the American Trading Co. In this capacity he acted for the Allis-Chalmers Co., the Ingersoll-Rand Co., Henry R. Worthington, the Erie City Iron Works, the Jewel Export Filter Co., the York Mfg. Co. and others. Returning to the United States in 1911 he went with the Worthington Pump & Machinery Corp., and in addition to miscellaneous engineering work he was sales engineer from 1913 to 1917, when he entered war work in the aircraft production bureau. He is a member of the American Society of Mechanical Engineers.

W. S. Pilling, Pilling & Co., Real Estate Trust building, Philadelphia, who recently returned to his office after recuperating from minor injuries received when struck by an automobile, will leave for Europe this month.

August J. Luedtke, secretary and treasurer of the Milwaukee Corrugating

WALTER H. RASTALL

Co., has been elected vice president of the Concordia Fire Insurance Co., Milwaukee. Mr. Luedtke has served as a member of the board of directors for a number of years.

R. K. Swift, for more than eight years manager of the New England branch of the Ingersoll-Rand Co., 11 Broadway, New York, and for 18 years in the employ of the company, has resigned and is taking a rest at his camp at East Weymouth, Mass.

Rudolph Kowalski has been promoted as plant superintendent of the American Wringer Co., Woonsocket, R. I., with which he has been connected for many years. Charles Yahaux has been made assistant plant superintendent. He has been with the company for nearly 30 years.

Roy Hood, at one time assistant purchasing agent of the Studebaker Corp. and later purchasing agent for the Maxwell Motor Co. and the Chalmers Motor Co., Detroit, has been appointed purchasing agent for the Rickenbacker Motor Co., which recently was incorporated in Michigan.

C. H. Landsittel, director of purchases for the Templar Motors Corp., Cleveland, and at another time in a similar capacity for the Haynes Automobile Co., Kokomo, Ind., has been made sales manager of the Climax Motor Devices Co., Chagrin Falls, O.

O. K. Davis, chairman of the advisory committee on foreign mails, and secretary of the National Foreign Trade council, has been appointed chief representative of the United States government to the Pan American Postal congress to be held at Buenos Aires this month.

Roy Davey, manager of the Detroit branch of the American Bosch Magneto Corp., Springfield, Mass., has been transferred to the company's main office, acting as manager of the manufacturers' trade department. Previously Mr. Davey had been advertising manager of the Chalmers Motor Co. and sales manager of the Bethlehem Motors Corp.

E. L. Keithley has been made manager of offices opened in the Alaska building, Seattle, by his father, E. A. Keithley, Rialto building, San Francisco, representative of the Central Foundry Co., the Essex Foundry Co., the Milwaukee Brass Mfg. Co., the Pittsburgh Valve, Foundry & Construction Co. and other manufacturers.

Fred C. Harris, Duluth, general superintendent of the Zenith Furnace Co. for the past 17 years, retired recently and has been succeeded by H. A. Brady who has been assistant general superintendent. His first experience in making iron was at a forge in Schroon, Essex county, N. Y., when he was 14 years old. Then he spent 10 years at the Crown Point magnetite iron mines in New York where he also gained a knowledge of smelting and in making ferromanganese. At 35 Mr. Harris was employed at Edith furnace of the American Steel & Wire Co., then he went to Cleveland as general foreman of the Central Furnace Co. For the past 17 years he was general superintendent at Duluth.

Rail Standards Need Revision

Changes Would Include Sections Regarding Chemical Analyses, Destruction Tests, Quality of Manufacture and Finishing—Optional Clause Proposed—Railroads Seek Further Improvement in Quality of Rails from Safety Standpoint

BY ROBERT W. HUNT

INTEREST in and connection with the manufacture of steel rails by the writer has extended over the entire period of their production and the establishment of specifications governing rail manufacture, resulting in the output of good rails and at the same time insuring practical commercial application, has received his careful attention. At this time the subject of rail specifications is, as always, of importance. Unfortunately however, the problem is somewhat of an unsatisfactory condition, due to the difficulty of rail manufacturers and rail consumers uniting on various phases of a specification aiming toward improved practice. The difficulties attending the work of the rail committee of the American Railway Engineering association have been pointed out by its chairman, George J Ray, in his letter to the association, dated March 10, 1921.

Little, if any dissatisfaction has been expressed with the actual wear of open-hearth steel rails. What the users desire, most of all, is a safe rail, meaning rails that, while generally affording long life under usual traffic and roadbed conditions, are free from sudden failures. This the railroads do not feel they are obtaining, and, in addition to the annoyance and expense caused by defective rails which

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From a communication from Robert W. Hunt, president Robert W. Hunt & Co., Chicago, dated July 26, 1921.

Revised Section of Proposed Specifications for Open-hearth Steel Rails

CHEMICAL COMPOSITION AND ANALYSES

4. (a) The chemical composition of each heat of steel from which the rails are rolled shall comply with the following: Carbon, not less than 0.60 per cent; manganese, not less than 0.60 per cent; phosphorus, not more than 0.04 per cent; silicon, not less than 0.10 per cent.

(b) Rails rolled from heats containing more than 0.75 per cent of carbon shall have the flanges near the ends painted yellow and be shipped separately, provided, however, that such heats do not have either the manganese content over 0.90 per cent or the phosphorus content 0.03 per cent.

(c) A chemical analysis for each element above mentioned, including sulphur, shall be made on each heat of steel cast for rails. The analysis shall be made on approximately equal portions of carefully mixed drillings taken from two ladle test ingots, one representing the steel going into the second regular ingot cast, and the other that going into the next to the last regular ingot. The methods for making the analyses shall be those adopted by the American Society for Testing Materials.

(d) The ladle test ingots shall be of such shape and size as to induce quick sound setting of the steel and, if necessary, a few pellets of aluminum may be added to the dipper to insure soundness. The drillings for analyses shall be taken not less than ½-inch beneath the surface.

(e) The complete analyses of each heat cast for rails shall be available for the inspector as promptly as possible and he shall always be furnished with a copy of it before the rails are loaded.

(f) The inspector may witness the manner of obtaining the drillings for analyses and the methods employed for analyzing, and he may take a portion of the original drillings at any time for checking purposes.

DROP TESTS

10. (a) If two of these test pieces do not break at the first blow, all of the rails of the heat shall be accepted, subject to the requirements of section 11.

(b) If two of the test pieces break at the first blow, all of the top rails of that heat shall be rejected.

(c) Second tests shall then be made from three test pieces selected by the inspector from the bottom end of the top rails of the same heat and ingots. If two of these test pieces do not break at the first blow, all of the remainder of the rails of the heat shall be accepted, subject to the requirements of section 11.

(d) If two of these test pieces break at the first blow, all of the second rails of the heat shall be rejected.

(e) Third tests shall then be made from three test pieces selected by the inspector from the bottom end of the second rails of the same heat and ingots. If two of these test pieces do not break at the first blow, all of the remainder of the rails of the heat shall be accepted.

(f) If two of these test pieces break at the first blow, all of the remainder of the rails of that heat shall be rejected.

DESTRUCTION TESTS

11. (a) A test piece representing the top end of the top rail from each ingot of each heat rolled, which has passed the drop test requirements of section 10, shall be nicked and broken to determine whether the interior metal is sound. If an interior defect shows on the fracture, the top rail of the ingot represented shall be rejected and a second test piece cut from its bottom end shall be nicked and broken to determine the character of the metal of the second rail. If an interior defect shows on the fracture, the second rail shall be rejected and a third piece cut from its bottom end for retesting. Thus the rails of each ingot shall be tested progressively from the top downward until the fracture shows sound metal, following which the rails of the ingot represented shall be accepted.

(b) An interior defect is interpreted to mean seams, laminations, cavities or interposed foreign matter or a distinctly bright or fine grained structure in the center of the section evidencing segregation, made visible by the destruction tests, the saws or the drills.

(c) Rails represented by test pieces found to be segregated shall be accepted as No. 2 rails.

(d) If, under the drop test requirements of section 10, the "A" and "B" rails of a heat have been rejected, but the "C," "D," "E," etc., rails accepted, the destruction tests herein specified will be waived on the accepted rails of that heat.

OPTIONAL CONDITIONS

12. (a) In case the manufacturer elects after due notice, the purchaser agree to accept hot sheared, punched and annealed tie plates rolled from the steel that would, in the ordinary course of the manufacturer's practice, be rolled into "A" or top rails from the ingots cast under this specification. It is understood that such tie plates shall be in accordance with purchaser's drawings and specifications.

(b) When a top discard of not less than 20 per cent is made on all ingots from which rails are offered for test and inspection, section 11 shall be waived.

QUALITY OF MANUFACTURE

(b) The steel must be well deoxidized in the furnace or ladle before the ingots are teemed, and the use of aluminum in the molds to insure the quiet setting steel desired will not be permitted.

(c) Heats or ingots, the metal for which has been poured over the top of the ladle or cast with a full running stopper not under the control of the operator, will not be rolled.

(d) Special care must be taken to insure the casting of good, clean, sound ingots, free from scabs and cracks and with reasonably flat tops. Bled ingots shall not be rolled.

(e) Treatment of the ingots in the soaking pits must be such as to insure thorough soaking with the subsequent increase of temperature necessary. Overheated or burned or white sided ingots shall not be rolled, neither shall ingots that have once been allowed to get cold.

FINISHING

22. (a) All rails shall be smooth on the heads, without rough crescent-shaped marks, and the bases shall be free from guide marks and scratches. They shall be milled square on both ends, but a variation of one thirty-second inch in a vertical direction to make head-long rails will be permitted.

(b) All rails shall be free from twists, waves, kinks or short bends, but rails containing a uniform sweep, the middle ordinate of which does not exceed 1 inch in 33 feet, will be accepted without cold straightening.

(b) The number of the heat and of the ingot number in the heat and a letter indicating the portion of the ingot from which the rail was made shall be plainly stamped on the web of each rail where it will not be covered by the joint bars. The top rails shall be lettered "A" and the succeeding ones "B," "C," "D," etc., consecutively; but in case of a top discard of 20 per cent the letter "A" will be omitted, the top rail becoming "B."

Seek 35 Per Cent Ore Rate Cut

Independent Shippers Contend Reduction Should Be at Least That Much on Basis of 1920 Operating Costs — Claim Steel Corporation's Railroads Exacted $30,000,000 Overcharge Since 1912—Exhibits Trace Effects of 6 Per Cent Income Policy

BY A. J. HAIN

INDEPENDENT iron ore shippers in their case before the interstate commerce commission are contending for a rate reduction of more than 35 per cent in the Lake Superior district. An examination of their exhibits submitted at the hearing of the case before Examiner Hosmer in Chicago last week reveals that the shippers petitioned the commission to reduce the rates so that the railroads would receive no more than 6 per cent profit. The exact rates desired were not stated. The exhibits, however, contain an extensive analysis of the railroads' operating costs, and while it is left for the commission to say what the new rates should be, it is inferred from the exhibits that the shippers believe they are entitled to a reduction of at least 35 per cent. Such a reduction equally applied, would mean a decrease from $1 to 65 cents for Minnesota shipments; from 85 cents to 55 cents for Gogebic and Menominee range shipments in Michigan and Wisconsin, and a proportionate reduction in the various rates from Marquette range. Marquette range rates, however, are not much in dispute as are the others.

Based on rates 35 per cent in excess of "reasonable," or 6 per cent income rates, independent shippers in 1920 paid $8,913,449 too much, according to the conclusions obtained from their exhibits. The same rates were in effect in 1919 and will remain in effect throughout 1921. As the shippers are asking for a refund of all amounts paid in excess of 6 per cent profit, since the 1919 rates became effective, the award if made would exceed $20,000,000.

One of the exhibits purports to show that since June 30, 1912 the independent ore shippers have paid the United States Steel Corp., indirectly, $30,000,000 in excess freight charges for ore handled over corporation lines. In each of the years, it is claimed, there has been an overcharge by the corporation's railroads, the Duluth & Iron Range, and the Duluth, Missabe & Northern. The exhibit is introduced with the statement that it shows:

1. That a rate of 44.5 cents per gross ton for the year ended June 30, 1914, would have been reasonable for the Minnesota carriers, as recommended by the report of the commission's division of statistics in its analysis of the carriers replies to the commission's 33 questions.

2. That the reduced rate of 55 cents per ton ordered by the commission and in effect for about three years was from 13 to 23 cents per ton too high.

3. That the increase from 55 cents to 63½ cents on July 27, 1917 was unnecessary and unjustified because a 46 cent rate would have been ample during the calendar year 1917.

4. That for the calendar years 1918 and 1919 the 1917 rate of 63½ cents was more than compensatory and a further increase of this rate to $1 per ton unwarranted by the earnings of these carriers.

5. That for the calendar year 1920, on account of increased transportation costs, no higher rate than 65 cents per ton of 2240 pounds, can be justified by these carriers.

6. That of the $63,313,476 excess income over 6 per cent return, approximately ½ or over $30,000,000 was contributed through these unjust and unreasonable rates by the independent iron and steel manufacturers to the profits of the United States Steel Corp.

The exhibit pertaining to the Steel corporation's roads in abbreviated form accompanies this article. The railroads have two months in which to reply to the representations made by the independents, and they probably will dispute the point that 50 per cent of the ore handled over the Steel corporation's roads is independent ore. Last year, the corporation's shipments over the D. M. & N. amounted to 15,479,334 tons, as compared with the independent's 1,853,339 tons; while the Steel corporation's shipments over the D. & I. R. amounted to 9,278,464 tons, as compared with the independent's 2,930,196. The corporation's portion in the first instance was about 90 per cent; in the second, about 70.

The exhibit shows the independent shippers consider 65 cents per ton would have been a reasonable rate from Minnesota ranges to the ore docks, instead of $1, in 1920; this representing a reduction of 35 per cent. In 1919 the reasonable rate would have been 59 cents, instead of $1. The lower figures would have allowed 6 per cent profit after all costs were figured. The shippers now claim that costs having come down from the peak as represented by 1920, a reasonable rate now would be less than 65 cents.

The following table compares the cost of transporting iron ore in Minnesota with the rates paid for the service, 1916 to 1920, inclusive. All railroads are considered in the comparison. Capital cost, of course, includes the 6 per cent rate; the rate paid, representing the alleged overcharge:

Year ended Dec 31	Iron ore operating cost	Iron ore capital cost	Total cost 2240 lbs.	Rate paid
1916.....	$0.2357	$0.1118	$0.3475	$0.55
1917.....	0.3025	0.1444	0.4469	0.6013
1918.....	0.3397	0.1537	0.4934	0.8911
1919.....	0.4068	0.1962	0.6030	1.00
1920.....	0.5098	0.1796	0.6894	1.00

A similar comparison is shown relating to the service from the mines on the Gogebic to Ashland, Wis., and from Menominee and Marquette ranges to Escanaba:

Year ended Dec 31	Iron ore operating cost	Iron ore capital cost	Total cost 2240 lbs.	Rate paid
1916.....	18.969c	15.280c	34.249c	0.45 c
1917.....	21.666	15.540	37.206	0.4859
1918.....	31.367	16.398	47.765	0.7695
1919.....	34.123	17.690	51.813	0.85
1920.....	41.155	18.530	59.685	0.85

Shippers' Exhibit in Ore Rate Case

Year ended	Ore tonnage handled over Steel Corp. roads	Excess income per ton over 6 per cent	Rate charged per ton	Reasonable rate per ton
June 30, 1912	16,263,503	$0.244	$0.746	$0.502
June 30, 1913	22,096,791	0.237	0.60	0.303
June 30, 1914	18,996,101	0.155	0.60	0.445
June 30, 1915	15,427,557	0.130	0.583	0.453
June 30, 1916	28,132,306	0.210	0.55	0.340
Dec. 31, 1916	34,002,850	0.232	0.55	0.318
			*0.55	
			†0.635	
Dec. 31, 1917	31,712,207	0.141	0.601	0.460
			‡0.635	
			§1.000	
Dec. 31, 1918	30,299,135	0.373	0.891	0.518
Dec. 31, 1919	24,681,938	0.413	1.000	0.587
Dec. 31, 1920	26,436,300	0.353	1.000	0.647

*To July 27. †From July 27. ‡To June 26. §From June 26.

American Shipping Gains

Washington, Aug. 2.—Documented American merchant shipping on June 30 numbered 28,500 vessels of 18,350,000 gross tons, compared with 28,183 vessels of 16,324,024 gross tons on June 30, 1920, and 26,943 vessels of 7,928,688 gross tons on June 30, 1914. This makes the increase in tonnage since the beginning of the war some 131 per cent. In the period in which the United States was at war the increase in tonnage was 2,020,000.

Midwestern Fabricators Meet in Massillon

The National Structural Steel society, an organization of representatives of steel fabricating companies of the Central states met in Massillon, O., July 29. Following the business session, officials of the National Pressed Steel Co. were hosts to the visitors. Fifty representatives from the largest steel fabricating companies in Ohio, Indiana, Iowa, Illinois, Wisconsin, Minnesota, Nebraska and Missouri, attended. The sessions were held in the assembly room of the Central Steel Co. and Karl E. Vogel, of the Omaha Steel Co., Omaha, Neb., presided.

All speakers emphasized the fact that of building and construction materials, steel had dropped to the lowest price compared with 1914. Mr. Vogel in his address said steel prices were now stabilized. He urged a national cooperation of efforts of construction steel men.

Other officers of the society are A. L. Denicton, of the Rochester Bridge Co., Rochester, Ind., vice president, and C. J. McIntosh of the Federal Bridge & Structural Co., of Waukaska, Wis., secretary.

Standards Need Revision

(*Concluded from Page* 310)

have to be removed from track after comparatively short service, the anxiety and menace to life caused by actual broken rails is at the same time great. Head failures in rails rolled from metal forming the tops of the ingots apparently are on the increase and internal fissures constitute a defect most dangerous and deserving a complete study.

The time is opportune for presenting a specification for consideration which offers advantages not found in others. Such a specification has been prepared and the parts which distinguish it from other specifications appear in the accompanying table.

Each ingot cast on a heat is a unit unto itself and deserving of being tested and treated as such. In a letter of Jan. 22, 1912, the writer recommended the nick and break test on every ingot, and explained this matter fully. The method then proposed is practicable and has been demonstrated by the fact that practically all rails made in Canada for the last six years have been so tested. But, because of the averseness of American manufacturers to permit it, the system has not been given a thorough trial in the United States. In lieu of this plan of testing, the writer suggests that if the manufacturer desires, the top rails of each ingot be rolled into tie plates to be hot punched, sheared and annealed, and which the purchaser agrees to accept in place of the tonnage of "A" or top rails that he ordinarily would obtain under his contract. Tie plates made from such steel have given satisfaction for several years.

Experiences have proven that the cold straightening of rails can be minimized and in some cases eliminated without detriment to the track conditions, and with such obvious saving to the manufacturers as would more than cover the cost of milling the ends of the rails square and free from burrs. Better attention to the soaking pit practice and restricting the cold straightening, will ultimately afford relief from the development of internal fissures.

The revised specification is not offered as the best that can be proposed, but is presented with the thought that it may help to compose the difference existing between railmakers and rail users.

Obituaries

WILSON L. FENN, president of the Fenn Mfg. Co., Hartford, Conn., builder of special machinery, died in a private hospital in that city, July 26, aged 63 years. He was one of the original incorporators of the Taylor & Fenn Co., Hartford, in 1907, and had been prominently associated with the building of special machinery in that city for many years. Mr. Fenn first received his knowledge of the business while with the Pratt & Whitney Co. In 1900 he established the Fenn Machinery Co. and seven years later it was combined with the Pheonix Iron Works as the Taylor & Fenn Co. Mr. Fenn served his connection with the company in 1914, and Jan. 1, 1915, formed a partnership with his son, under the name of the Fenn Mfg. Co. The son, Wilson A. Fenn, is general manager of the company.

William P. Siebert Jr., son of W. P. Siebert of the Carnegie Steel Co., died at Roswell, New Mexico, July 29. At the time of his death, Mr. Siebert was eastern sales manager of the Weirton Steel Co., Weirton, W. Va., with offices at 30 Church street, New York, and before locating in New York had been with the same company at their Clarksburg and Weirton plants.

Francis B. Allen, for more than 35 years a vice president of the Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn., died at his home in that city July 27, aged 80 years. A machinist by trade, he entered the American navy as assistant engineer with the rank of ensign in the civil war and after the war was an engineer for the Novelty Iron Works, New York. In 1872 he joined the Hartford company as a special agent and continued with it until his death. He was a member of the American Society of Mechanical Engineers and the American Society of Naval Engineers.

Maj. Louis Albert Fischer, chief of the division of weights and measures, United States bureau of standards, died at his home in Washington July 25 following a lingering sickness. He was 57 years old and a native of Washington. He was in charge of the bureau division ever since its founding in 1910. During the war he was in charge of gage designs. He was a member of the Washington Academy of Science, the American Society of Mechanical Engineers, the American Physical society, and the Physical Society of France; a fellow of the American Association for Advanced Science, past president of the Philosophical Society of Washington and secretary since its organization of the National Conference on Weights and Measures.

William Robert Park, Taunton, Mass., consulting engineer for the Hancock Inspirator Co., Boston, prominent in engineering circles for many years, died in a Taunton hospital July 29, aged 90 years. He was one of the original stockholders of the Hancock Inspirator Co., in 1876, and for years was its manager. He was the founder and up to the time of his death a member of the firm of W. R. Park & Son, Taunton, steam appliance fitters. He was an expert in the field of steam and gas engines and had numerous patents, the value of which was recognized when a gold medal from the government was bestowed on him for successful mechanical achievement. Mr. Park was a life member of the American Society of Mechanical Engineers.

Steel Leads in Foreign Trade

Industry Has Been Consistent and Organized Exporter—Capacity of Mills Puts United States in Favorable Position—World Needs Believed To Be Largely Statistical — Industrial Census Committee Is Named

WASHINGTON, Aug. 2.—American steel producers as a whole look upon exporting as a permanent part of their business although with world conditions as they are they have relatively small chance of getting any volume of this foreign trade until the bookings of German and Belgian mills approximate capacity, declares Walter S. Tower, recently made head of the iron and steel section of the bureau of foreign and domestic commerce.

"The feeling is that exporting is made necessary if the industry is going to have capacity operations and maximum prosperity," states Mr. Tower. "All will agree, whether times be good or bad, that the industry today has capacity in excess of reasonable expectation of domestic demand. The drop in steel exports is not due to any 'laying down' on the part of the industry because of adversity at home. Despite the fact that some producers feel more pessimistic than in recent years concerning the export market, it is only fair to say that the steel industry generally, more than many other industries, is a consistent exporter."

Steel exports of the United States received a great impetus shortly after 1900 with the formation of the United States Steel Corp., according to Mr. Tower, and the organization of the United States Steel Products Co. marked another step forward, especially the establishment of warehouses on the west coast of South America. Other companies which have shown a lively interest in the export trade are the Jones & Laughlin Steel Co., the Republic Iron & Steel Co., the Youngstown Sheet & Tube Co., the United States Cast Iron Pipe & Foundry Co., and the Bethlehem Steel Co.

Reach High Point In 1912

From the early 1900's until the beginning of the war in 1914 American exports of steel were active, with the high point reached in 1912 when this country exported approximately 20 per cent of the world's 15,000,000-ton export business in steel, according to Mr. Tower. By eliminating those factors of the export trade in which the United States could not possibly hope to figure, such as German shipments of steel to Austria and the German-Belgian-British trade, the percentage of competitive possibilities realized would be greatly increased.

In rails and barbed wire, American producers have been able to compete almost anywhere in the world. British, Belgian and German competition in sheets limited American sales to the adjacent countries of Canada, Mexico and Cuba. Similarly, the Welsh tin plate makers restricted American makers to Canada and Cuba. Taken as a whole, the American export trade in steel showed up fairly consistently up to the war, says Mr. Tower.

On the question of future exports Mr. Tower refuses to venture a guess. Statistically, he points out, it is possible to conjure up a world shortage of 40,000,000 to 60,000,000 tons of steel. But a large part of this shortage, Mr. Tower believes, may prove more statistical than real because of retrenchment and the continued use of materials which ordinarily would have been discarded long since. Certain South American countries have not bought any rails for some years, but when they do they will not make good the delayed replacements but will start from scratch, is the outlook. Because the world ate less bread than usual last year is no indication it will eat more than the average this year, he reasons.

Although definite progress is being made by Mr. Tower on the iron and steel section of which he is chief, still much of the present effort is being concentrated on the groundwork. Steps have been taken by him toward the selection of some assistants, but no announcement is available at this time. Mr. Tower's intention of going abroad about Oct. 1 remains unchanged.

Along the line of building up the commodity sections of the bureau of foreign and domestic commerce which congress authorized recently, Secretary Hoover has obtained Walter H. Rastall to head the heavy machinery division. This follows closely on the selection of A. J. Wolf, of New York, as head of the division of commercial laws. Mr. Rastall will study the problems connected with the marketing of American heavy machinery.

Secretary Hoover last Friday again urged greater co-operation between industries and the department of commerce, before a conference called by the National Association of Manufacturers to consider simplification of the 1921 industrial census. With Dr. Julius Klein, chief of the bureau of foreign and domestic commerce, he explained the relation between the new commodity sections and various industries and urged a closer linking-up, especially to make the department's monthly business summary a closer index to business conditions.

Sentiment at the conference was favorable to increasing the minimum requirements for rating an institution as a manufacturing establishment. In the taking of the 1919 census all institutions employing five or more persons and turning out annually a product valued at $500 or more were included. In the 1921 industrial census the proposal is that plants with an annual production below $20,000 to $25,000 be eliminated. It is pointed out that the 1914 industrial census shows that only 4.7 per cent of all manufactures came from plants having an annual production below the $20,000 mark, and less than 35 per cent came from plants under the $100,000 mark.

Committee Is Named

To work with Census Director Steuart in planning the forthcoming industrial census a committee was appointed, of which Nathan B. Williams, counsel for the National Association of Manufacturers, Washington, was made chairman. Other members are J. W. Drake, National Automobile Chamber of Commerce, New York; A. E. Marshall, chemical division, American Engineering council, Curtis Bay, Md.; L. M. Fanning, American Petroleum institute, New York; E. W. McCullough, fabricated production department of the United States chamber of commerce, Washington; A. H. Willett, National Coal association, Washington; L. C. Boyle, National Lumber Manufacturers' association, Washington; W. D. Biggers, American Hardware association, Detroit, and Paul T. Cherington, National Association of Wool Manufacturers, Boston.

Beginning Sept. 5 *Commerce Reports* the official publication of the bureau of foreign and domestic commerce, will be issued weekly instead of daily, and news will be grouped under appropriate headings for various industries. From time to time contributions will be made by the heads of the new commodity sections. It has also become known that Secretary Hoover has advised manufacturers of pumps to form an association in order to provide a point of contact with the department of commerce.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Cochrane Steam Specialty Co. of Massachusetts has been organized to represent in New England a number of well known manufacturers of power plant equipment including the H. S. B. W. Cochrane Corp., Philadelphia, manufacturer of feed water heaters, steam and oil separators, V-notch meters and metering heaters, hot and cold process water softeners, multiport valves, etc. Another company which the new organization will represent is the Steam Motors Co., Inc., manufacturer of steam turbines for driving generators, pumps, fans, etc., and it will also represent the D. Connelly Boiler Co., Cleveland, builder of water tube steam boilers. The offices of the new company will be located at 1045 Oliver building, Boston, and will be in charge of Elliott Greene.

* * *

FOUR factory buildings, 251 and 255 Bush street and 362 and 364 Smith street, Brooklyn, have been leased by the Richmond Screw Anchor Co., Inc., New York, effective Aug. 1, for the manufacture of heavy hardware used in the construction of buildings.

* * *

THE Enterprise Machine Co., Pittsburgh, recently sold its property on Jane street near South Twenty-sixth street, Pittsburgh, to the Troop Mfg. Co. The new owner of the plant will utilize it for manufacturing purposes. It consists of a 2-story brick factory building.

* * *

THE new addition to the plant of the J. B. Moss Iron Works, Wheeling, W. Va., is rapidly nearing completion. The steel framework has been set and a large force of men are now engaged in laying the steel floors. The plant is scheduled to be completed by the latter part of August.

* * *

ADVICES have been received to the effect the Kingsbridge Iron Works, Inc., 405 East Ninety-ninth street, New York, has purchased a site for a new plant. The site is improved with a clubhouse, formerly used at the Morris race track. This latter will be remodeled for the manufacture of ornamental iron and other products.

* * *

ORGANIZED to manufacture and sell the repelling arc furnaces formerly made by the Industrial Electric Furnace Co., Chicago, the Re-Pel-Arc Furnace Co. has been established in headquarters at 227 East South street, Indianapolis. Branch offices are maintained in several larger cities and efforts now are being made to establish agencies abroad.

* * *

MANUFACTURING property belonging to Thomas Macbeth at 6116 to 6300 Park avenue, Cleveland, has been bought by the Champion Spring Co. The plant has been occupied by the Champion Bed Spring Co. but the new company has been organized and has taken over the old. E. H. Lemke is president of the Champion Spring Co. the newer organization. The company manufactures bed springs, cots and steel couches.

* * *

TAKING advantage of the dull business period, the Pharo Mfg. Co., Detroit, maker of governors, has moved its plant from Detroit to Bethlehem, Pa., where the company has increased manufacturing facilities. At a recent meeting of the company, the following officers were elected: President, R. P. Hutchison; vice presidents, R. D. Chapman and G. C. Pharo; treasurer, W. B. Myers; treasurer, I. W. Gangawer; and purchasing agent, B. C. Sawyer.

* * *

SALE of the property of the bankrupt Monarch Tractor Co., Watertown, Wis., to E. D. Caldwell, New York, has been confirmed by the federal court. Mr. Caldwell submitted the highest bid at the recent auction of the property, which was $44,000. The plant has been running at reduced capacity since financial difficulties overtook the company. Mr. Caldwell plans to increase schedules somewhat, retaining the present organization with A. M. Hornbeck as general superintendent.

* * *

SALE of the plant and property of the Ungar Sheet Metal Products Co., Youngstown, O., to interests represented by Fred S. Ullman and Samuel H. Weinreich recently was announced. A new company is being formed to take over the property which will be capitalized at $50,000. The Ungar plant was devoted to manufacturing stove pipe and consisted of a modern fireproof building, 125 x 165 feet, equipped with modern machinery. The new owner, it is reported, will install additional equipment for the manufacture of other lines of sheet metal products.

* * *

OPERATION of part of the Bucyrus Machine Tool Co.'s plant at Bucyrus, O., as a general machine and repair shop, is to be undertaken shortly by G. P. Young and A. W. Wheeler. The arrangements have been made with the receivers for the company who closed it some time ago after its operation by the Browarsky-Crum Mfg. Co. Mr. Wheeler has been manager of the Galion Iron Works, Galion, O., formerly having been with the Browarsky-Crum organization and before that was superintendent of the Allen Motor Co., Bucyrus. Mr. Young was superintendent of the American Machinery Clay Co.'s plant at Bucyrus and remained with the Hadfield-Penfield Steel Co. after the former company's reorganization.

* * *

WORK has been started by A. M. Castle & Co., Chicago, on the construction of a new steel warehouse building at Blackhawk and North Branch streets. The building will be 211 x 232 feet, constructed of steel with pressed brick facing walls, steel sash, concrete floors and cement tile roofing. The west 75 feet is to be two stories and the second floor will afford space 75 by 211 feet for the general offices. The main building will be used for the storage of sheets, tubes, cold rolled shafting, rivets, bolts, bars and boiler accessories. Materials will be handled by four electric traveling cranes with entrances for trucks under each crane. Carload shipments will be handled from switch tracks that terminate within the building after passing under each crane runway. With this new plant, the buildings of A. M. Castle & Co. will cover more than five acres.

Pickets Are "Keyed" to Workers

Youngstown Judge Restricts Number in Proportion to Nonunion Employes on Job, and Requires Them To Register with Employers—Valley City's Building Trades Now on Open Shop Basis—Cleveland Moving to "Out-and-Out Fight"

THE open shop has been established in the building trades in Youngstown, O., after a prolonged dispute, and a novel court decision is credited with having been an important factor in the outcome. The decision rendered by Judge Dahl B. Cooper in the court of common pleas limits the number of pickets the trade unions may have on a job in proportion to the number of workers, and furthermore requires the pickets to identify themselves and register their names with the employers. A somewhat similar decision was previously rendered in the suit brought by the master printers of Cleveland against the printers' union to restrain pickets from committing acts of violence. In that case the court restricted the number of pickets permitted at each plant to two, with the exception that where several printing plants are in one building eight pickets may be allowed. Pickets are required to register.

Judge Cooper's decision is believed to be the first rendered specifying a certain number of pickets, based on the number of nonunion workers on the job. The court said: "On any job where 50 or more men are employed the number of pickets shall not exceed 12; on jobs employing 25 to 50 men, the number of pickets shall not exceed six; on all jobs employing 25 men or less, the number of pickets shall not exceed four."

Building contractors in Youngstown decided to break away from the unions in the spring, when agreements expired. Contractors in many other cities made similar avowals but in the majority of cases were forced to yield and sign new agreements. The Building Trades Employers' association of Youngstown hired nonunion men, brought them from other cities, established a camp and proceeded to "go through with it." At present building is going forward at a more rapid and efficient rate, according to the contractors, than if they had continued under closed shop conditions.

The court case grew out of the destruction of a large tower on the Rayen school. The tower was destroyed at night, the supporting cables being cut away. Portions of a hacksaw were found nearby the next day. The Moore-Lamb Construction Co., sought an injunction against the Amalgamated Steel Metal Workers' union, and subsequently the issue between the Employers' association and the unions was joined in the one case. The injunction was the same as that commonly issued by a court of law, except that Judge Cooper sought to make its enforcement automatic. No picketing was done after the injunction was issued; "peaceful" picketing was of no avail. Trouble subsided and the "strike" was broken. Nonunion workmen are paid the same wages as those awarded by a court of arbitration in the building trades dispute in Cleveland, representing a moderate reduction over the rates in effect last year

"No Peace With Unions"

While the Cleveland builders are employing union labor and paying wages awarded by the arbitrators, a jurisdictional fight has resulted in a lockout of the carpenters and revived the open-shop issue. The carpenters refused to abide by the decision of the National Board of Jurisdictional awards, involving the question of which union should do certain work in installing metal doors. The carpenters lost the case, but called a strike on a certain building. When the carpenters were admitted to the wage arbitration in the spring they agreed to cease calling jurisdictional strikes and to respect their agreements. Their strike was not supported by the Building Trades council. All contractors who are members of the Building Trades Employers' association now refuse to have any dealing with the carpenters' union.

The association's bulletin gives evidence of the contractors' exasperation over the whole union system and foreshadows an out-and-out fight for the open shop. It states:

"Never before at any one time were so many building unions either actively causing trouble to employers or actually engaging in strikes as is the case today.

"While employers have attributed much of their trouble of the last three years to the labor shortage, it remained for a period of comparative unemployment to set the record of labor troubles and to prove that the unions, in their present mood, are not fit parties to trade agreements, because agreements mean nothing to them.

"The carpenters' strike and lockout, culmination of a long series of abuses, in which union promises have been as unstable as smoke rings, is the top liner of the present situation, but it is not the only event of its kind.

"It illustrates the working of the collective bargaining system under conditions which ought to be the most favorable to peace. Employers will be asking themselves whether the strife would be any more severe in a straight out fight for the open shop. The latter, at least, would offer substantial results in the case of victory, while collective bargaining with irresponsible unions seems to mean just an endless process of setting up pins to have them knocked over again."

Cuts Wages to 30 Cents

The Jones & Laughlin Steel Co., has cut the wages of common labor from 37 to 30 cents an hour, effective Aug. 1. Downward readjustments in the same ratio were made at the same time for all wage and tonnage employes. Practically all large independent companies in the country have now reduced to the 30-cent level or have gone below that figure, the latter being particularly true in the East.

Gain in Immigration

Washington, Aug. 2.—May statistics have been announced by the bureau of immigration, showing that 69,764 immigrants entered the United States and 16,337 emigrants departed. For the first five months the number entering was 317,691 and the number departing 85,163, making the net gain between Jan. 1 and June 1 232,528. In the 11 months ending with May the net gain in aliens was 534,354.

Ship Tonnage Declines

Washington, Aug. 2.—Private American shipyards on July 1 were building or had under contract 148 steel vessels of 519,564 gross tons, compared with 163 steel vessels of 581,631 gross tons on June 1, states the bureau of navigation. This is exclusive of government or shipping board tonnage. The New York Shipbuilding Corp., Camden, N. J., on July 1 was building or had under contract ships totaling 50,090 gross tons. Second was the Sun Shipbuilding Co., Chester, Pa., with 46,700 tons, and third the Northwest Bridge & Iron Co., Portland, Oreg., with 42,250 tons.

Tool Activity Greater in July

Railroads, Automobile Makers and Schools Issue Lists and Do Some Buying Which Somewhat Enlivens Equipment Markets for the First Time in Weeks—Export Requirements Are Small and Crane Needs and Buying Fall Off

GREATER cheerfulness in the machinery and machine tool market continued practically throughout July, having originated from the increased activity which came about just before the close of June. This activity was the reflection of an apparent growing influx of inquiries, something the market had not seen in weeks. The inquiries in themselves were not of any partciular size or value, with some exceptions, but the aggregate number, with some resulting buying, gave dealers and machine builders reason to look forward to a brighter and more hopeful future. At the close of July this feeling appeared to be continuing.

Railroads Encourage Hopefulness

THE better feeling throughout the month was somewhat warranted by railroad activities and operations in the automotive industry. The railroads, with potentially available funds as a result of wage revisions and force reductions July 1 and with the possibility of receiving $500,000,000 additional in advance settlement of claims against the government, showed some life by inquiring for track materials and supplies, car repairs and a few tools. The automobile manufacturers caused some surprise by continuing operations at a rate which previously it was believed would have to be curtailed or stopped entirely. The two industries are expected to continue in their present status, if not increase their activity.

Illinois Central Closes on List

THE result of these two developments in the situation was some buying of equipment by representatives of the two industries. The Illinois Central railroad bought between $75,000 and $80,000 worth of machine tools, but at prices which were said to be discouraging to dealers. The Santa Fe and the Northwestern railroads were in the market but did not close. Other railroads made informal inquiries and some took single tools or two. More actual buying by the railroads is looked for in the current month when savings in wages will be actual and not prospective. The placing of car repair orders is expected to be reflected in some buying by repair shops, this general program being considered extensive.

Automobile Parts Makers Active

IN THE automobile industry, the purchasing of parts by some of the leading makers resulted in some small tool sales, according to reports to dealers. The Ford Motor Co. was perhaps more active than any other manufacturer of motor cars and several orders were scattered among parts makers. These in turn placed some additional equipment, although the aggregate of these lots was not large. The Durant Motors Corp., Long Island City, took some tool room equipment, including five machine tools. Other motor car makers appeared in the market for various kinds of equipment.

Schools Are Lively Factor

ONE field of activity in July which attracted attention of the dealers was the educational. The requirements of high school and vocational institutions kept dealers busy figuring and some orders placed made the month's gross sales larger than otherwise would have been the case. Eighteen such tools were sold to the government's vocational training school at Valparaiso, Ind., the order totaling $16,000. These tools were rated 80 per cent efficient. The Canton, O., board of education has opened bids on a list of 25 tools; Erie, Altoona, Johnstown and Butler, Pa., schools have lists pending. Philadelphia schools are reported to have placed a sizable order for some shop equipment.

Quietness Prevailed in Exports

EXPORT requirements, as reflected in the eastern market, were not particularly numerous during July, but several sizable lists made their appearance. One of these was for 20 machine tools as issued by Dwight P. Robinson & Co., Inc., for irrigation work in Brazil. This order was placed and work on it has been started. Buying of railroad equipment and rolling stock for the Chinese and Mexican government railroads is expected to call for some machine tool equipment, although practically none was developed during July. These inquiries had been before the steel and railroad markets for some time.

Not Many Prices Are Cut

WHILE some low prices were developed in the sales of the month, many of which were bid at auction, few price reductions actually were made. The General Electric Co. and the Westinghouse Electric & Mfg. Co. each reduced the prices on motors 10 per cent. A line of arbor presses was cut 15 per cent; a grinder manufacturer made a similar reduction, it was reported, as did the maker of a line of turret lathes. Other prices generally were unchanged, but it was felt attractive business would bring out concessions of considerable size.

Repair Shops and Garages Active

SMALL tools were in demand in July more than the larger units. Repair shops and garages have been fairly active during the general depression of business and as a result have bought numerous small units. This is expected to continue for some time.

Few Cranes Are Bought

CRANE inquiries during the month were in small volume. Sales were even smaller. A New York consulting engineer inquired for 22 electric overhead cranes but the order was not closed. It was expected, as several of the cranes were duplicates, the list when actually closed would run approximately 15 units. Another export inquiry was for 26 of this same type but the order was not placed. The American Sugar Refining Co. took four overhead electrics for its new Baltimore plant. A New Jersey company figuring on the proposed New York-New Jersey vehicular tunnel made inquiry for 12 cranes, six of which are jib cranes, for estimating purposes only. Several industrial organizations and schools were in the market for cranes of various types, but only a few were placed. The Ford Motor Co., Detroit, has been receiving regular deliveries on several cranes bought from a northern Ohio maker. These are replacement cranes.

Improvement in Tool Demand

Machinery and Equipment Dealers Report Slightly Improved Demand Is Noticeable though Not General—Smaller Buyers More Active—Quoted Prices Hold but Concessions Are Easily Obtainable—Crane Market Dull

ALTHOUGH for the most part, orders and inquiries for machine tools and equipment in the week past were few and of small size, dealers in various parts of the country continue to report a slight improvement in demand. This improvement is especially noticeable in the Central states, but as the orders forthcoming are principally for single units, dealers state the improvement is not a forerunner of a genuinely active machine tool market. However, the improvement is taken as representative of the need for equipment which many manufacturers are meeting now that small orders for various products are being placed with them and industrial operations generally are slightly better.

Dealers are concentrating their efforts in selling their equipment to the small jobbers and especially makers who at present are the largest buyers. In view of the fact the larger companies are operating at fractional capacity with many idle tools in their plants, this policy of soliciting the smaller interests, it is believed, will prove more fruitful to machine tool sellers. The railroads continue out of the market, with the exceptional purchase of a single machine here and there. However, dealers continue to hold out the hope these interests shortly will come into the market, although the confidence that they would soon be a large factor, which was expressed several weeks ago, is not so strong.

Outstanding inquiries are few but the McKinley High school project at Canton, O., which involves about $30,000 of machine tools and equipment continues of leading interest in the Middle West. Bids were closed last week, but no awards have been announced. A number of single tool inquiries are current and more are coming out daily. Industrial operations in some sections are reported better. In New England the textile and the boot and shoe industries are reported to be increasing operations, while in the Central states the automotive industry is operating satisfactorily.

Machine tool prices continue to hold at the established levels but it is common knowledge among users that the quoted prices can be considerably shaded on a sizable order. Used equipment prices are erratic, dealers in this equipment seeming to be willing to sell at almost any prices they can get. A decided slowing up in demand for this latter class of equipment in the past few weeks has been shown. The crane market is quiet and the present outlook for a revival of buying soon is not promising.

Purchase of 18 Tools Features Eastern Market

NEW YORK, Aug 2.—A list of 18 new and resale machine tools has been purchased by the Batavia Car Co., Batavia, N. Y., from a New York dealer. This represented the largest transaction of the past week. Other orders reported include a set of bending rolls, placed with Hilles & Jones, Philadelphia, and a hydraulic riveter, awarded the Birdsboro Foundry & Machine Co., Birdsboro, Pa., both for the Hendrick Mfg. Co., Carbondale, Pa. Three additional machines have been placed by Dwight P. Robinson & Co., 61 Broadway, which concludes their purchases of machine tools. The situation generally is listless, although an improvement is noted in some quarters.

The Virginian railroad, Norfolk, Va., has issued an inquiry for a 10-ton electric overhead crane, with 73-foot span, for installation in its shops at Elmore, W. Va. The large list of overhead cranes for export may not become active for several weeks. The time set for estimating figures to be in was July 26, and these figures are now under advisement. In the event the project goes ahead it is believed a new inquiry will be issued.

The Hendrick Mfg. Co., Carbondale, Pa., is understood to have awarded two electric overhead cranes to the Pawling & Harnischfeger Co., Milwaukee. One crane is to be of 10 tons capacity, with 51-foot span, and the other, a 5-ton crane, with approximately 22-foot span. C. P. Perin & S. M. Marshall, 1107 Broadway, consulting engineers, have closed on a 5-ton electric crane and a 5-ton handpower to an unannounced bidder. The cranes are for export. Bids were closed recently on a 12-ton handpower crane, with 29½-foot span, for Porto Rico. The New Jersey Foundry & Machine Co., 90 West street, was low.

The state superintendent of public works, Albany, will close bids Aug. 17 on two 3-ton electric revolving cranes for the barge canal terminal, Cowanus bay, Brooklyn. The Northwest Engineering Co., 149 Broadway, has sold two 10-ton cranes, mounted on caterpillar tractors, one to the Mt. Vernon Builders Supply Co., Mt. Vernon, N. Y., and the other to the Highgrade Builders' Supply Co., 94 Prospect avenue, Brooklyn. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has been awarded eight 3-ton hoists by the York Mfg. Co., York, Pa. Henry R. Kent & Co., Ruthford, N. J., are in the market for a 20-ton locomotive crane, new or used.

Tool Sellers Are Encouraged

PITTSBURGH, Aug. 2.—Real improvement still is lacking in the machine tool and equipment market but the issuance of a few more inquiries has caused sellers to feel more encouraged. Mose of these are for individual tools

although occasionally a larger list is introduced. A case in point is the list of the McKinley High school, Canton, O., on which bids were opened last Friday While this only means $40,000 or $50,000 of tools, it attracted more attention in the trade than was accorded a $300,000 or $400,000 list a couple of years ago. Bids also were taken until yesterday by the Harrison township board of education, Natrona, Pa., on a combination woodworking machine, including an 8-inch jointer and a 32-inch band saw, saw table and shaper, and borer attachment belted to a 7½-horsepower alternating current motor; also an 18-inch single surface planer with 5-horsepower motor. Edward M. Heller & Co., West Kinzie street, Chicago, is in the market for used machinery. Its list includes two 10 x 72-inch, three 10 x 50-inch, and ten 10 x 36-inch cylindrical grinders, four gear hobbing machines, and two ⅜-inch 5-spindle horizontal drilling machines. A Pittsburgh district user is in the market for saws, saw tables, planers, engine lathe, etc.

The demand continues fairly heavy for used boiler and plate shop equipment such as punches, shears, bending rolls; a 6-inch angle bending roll, and a 6 x 6-inch angle shear being two typical inquiries. A local North Side user bought a 12-inch quick change lathe this week while another 14-inch plain lathe went into the Coraopolis territory. A few inquiries are current for large lathes but buyers continue to withhold orders. Several glass plants have been purchasing lathes for mold work, two going to a glass plant in Mt. Vernon, O., this week. This shop also wants a shaper.

One house has received some unimportant inquiries, mostly for single machines. Some inquiries are being issued by manufacturers who will have to buy equipment in case they receive certain orders. Approximately $25,000 is to be spent in new buildings and equipment by the Conewango Car Co., Warren, Pa., in replacing the buildings and machinery damaged by fire, formerly operated by the Allegheny Steel Tank Car Co.

Crane sellers report a continuance of the quiet period. The Brier-Hill Steel Co. has put out an inquiry for five cranes, three 15-ton and two 35-ton, for estimating purposes for a building to receive consideration later. The Wheeling Steel Corp. still postpones action on the two cranes for Portsmouth, O., and the three mill type cranes for Beach Bottom, W. Va., the latter covering one 5-ton with 71-foot boom, one 5-ton with 54-foot boom and a revolving jib crane. The United Engineering & Foundry Co. is going ahead with the foundations of its building for which it inquired for a crane a month ago. This may mean the reinstatement of an inquiry for a 15-ton crane with 5-ton auxiliary. An early award of the 10-ton crane for the Greenville Steel Car Co., Greenville, Pa., is expected.

Improvement in Demand Noted

CHICAGO, Aug. 2.—A slight improvement in the machine tool market throughout the West is noticeable. Most observers, however, caution against taking this as an indication of an extended buying movement as nothing tangible in the present situation in this district points to any general demand for tools before the end of the year. The low prices which prevailed in the recent purchase of nearly $100,000 of tools by the Illinois Central railroad have had the effect of making prospective buyers more cautious than ever and other railroad lists which are out are decidedly inactive at present. The Rock Island list is thought to be one of the most promising. Sales during the past week show an improvement over any week in the past two months even disregarding the Illinois Central purchase. The buyers were for the most part small unclassified manufacturers who have put off the purchase of tools all year in the hope of better business conditions. Scattered garages and automobile repair shops throughout Wisconsin, Illinois and Iowa have placed orders. A Wisconsin vocational school bought three motor-driven tools and another school is in the market for five or six machines. A Waukegan, Ill., manufacturer is said to be in the market for 17 tools. Inquiry for individual machines gives promise of continued moderate buying.

Sales Continue To Be Small

BOSTON, Aug. 2.—Sales of machinery and machine tools in this district continue confined to single units, with the exceptional sale of a small odd lot here and there being noted. So far as known there are few interesting inquiries in the market and dealers are confining their efforts to drumming up business in industries not directly connected with the metal trades. This latter industry is in a decided state of depression, and the wage question is put forth as the main reason.

However, in the textile industry, operations continued to improve steadily, and textile plants here are now reported operating from 75 to 95 per cent of capacity. The boot and shoe industry is operating at a rate of 60 per cent of capacity and the outlook for improvement is said to be good. Despite the improved operations in these industries little machine tool buying is being done by them. Machinery producers and dealers are suffering from the large amount of used equipment on the market, as all of this must be absorbed before any sizable order for new equipment will be placed. No changes in prices have been announced but in some quarters the belief has been expressed, that further reductions will be announced in the fall.

Improvement Is Expected Soon

MILWAUKEE, Wis., Aug. 2.—The local machine tool trade reports the volume of business in July was slightly higher than in June. Trade last month consisted almost entirely of single tool orders, as in the previous two to three months. The metalworking industry moved forward slowly and in the absence of the necessity of shop extensions, new plant construction, and a rarity of cases of the establishment of new enterprises, demand was very flat. Nevertheless, the need of replacements of equipment in industries which are slowly regaining their stride has been opening opportunities for more business in the last few weeks. Milwaukee county has purchased a motor-driven thread cutting lathe at a price of $860. A number of boards of education in various Wisconsin cities are inquiring for metalworking shop equipment for junior high and vocational training schools, although much of these needs are being filled out of government stocks. Automobile parts shops are fair buyers of milling machines.

Demand Limited to Single Units

TORONTO, Ont., Aug. 2.—Demand for machinery and machine tools in the Canadian market continues limited to single units. Construction of new plants and the enlarging of old ones has been exceedingly backward with the result machinery and tool requirements are extremely low. The depressed state of business generally has had an adverse effect on manufacturing conditions throughout the Dominion. This state of affairs continues to be reflected in a cutting down of operations, many plants operating only about 10 to 15 per cent of capacity. Some dealers believe the worst stage of the depressed market has passed and are optimistic with regard to fall demand.

Inquiries for new tools are coming forward in fairly large numbers, but only a very small number of these

turn into sales. Used equipment has fallen off in demand during the past few weeks. Small tools are in fair demand with users continually entering the market for small lots, but no heavy buying is in existence. One of the bright signs of the week is the announcement that the Lorne Tractors, Ltd., has a site in Chatham, Ont., and will start work within a month on a large plant. Peters, 43 Yonge street, Toronto, Ont., is in the market for an 18 to 24-inch gap lathe; driller; keyway machine; emery stand and buffer. The Vancouver Rolling Mills Co., Ltd., Eburne, B. C., is in the market for a 16 or 18-inch two stand mill with roughing and flat finishing rolls; also scrap alligator shears, 30-inch blade, capable of cutting up to 5 or 6-inch cold square steel. The Administrative commission, Montreal, Que., will receive bids until Aug. 20, for the construction of an electric pumping station to cost $500,000, E. A. Doucet is engineer.

School Inquiry Interests Dealers

CLEVELAND, Aug. 2.—Chief interest of machine tool and equipment dealers in this district is centered on the equipment requirements of the McKinley high school project, at Canton, O. Bids on this equipment, which included lathes, shapers, grinders, presses, hoists, etc., and involves an expenditure of approximately $30,000, were closed last Friday and actual awarding of the orders is expected soon. Other inquiries being worked on here are mostly for single tools with an exceptional one current involving two or more. Among those in the market for equipment are the Star Machine & Tool Co., Cleveland, for a punch press; the National Brush Co., Aurora, Ill., for a punch press; the Waugh Foundry & Machine Works, Williamson, W. Va., for machinery for repairing mining equipment and the Clark Welding Shop, Richmond, Va., for drill press, lathe and other equipment.

Sales during the week were small, but dealers assert they are getting enough small orders to keep them partly busy. Although the larger plants in this district are doing little buying the smaller organizations, such as those making small automobile accessories, novelties and specialties, are reported buying in a fairly sizable volume in the aggregate. Consequently dealers are concentrating their efforts to filling the requirements of these shops. The railroads are still expected to come into the market for fairly sizable amounts of equipment, but up to date purchases by these interests continue confined to single tools.

Prices, at least the published ones, continue to hold at the established level, but it is common knowledge among buyers here that considerably lower quotations can be obtained on a sizable purchase. Used equipment prices, are uncertaiin, this equipment being sold at almost any figure obtainable. Dealers in new equipment report they are not experiencing the heavy competition from used equipment dealers that they have in the past. This, they state, is due to the fact that the larger buyers of equipment when they do buy, insist upon new tools, no matter what price advantages are possible by buying used equipment.

Activity in the metalworking trade in this district continues at a low rate, although a number of automobile manufacuring companies report they are operating near capacity and in one or two cases report 100 per cent activities. Detroit automotive companies are also operating at a good rate, reports stating operations are on a basis of 70 to 75 per cent of capacity. Otherwise, however, the metalworking trade here is practically at a standstill, many shops scarcely operating 35 to 40 per cent of capacity.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BIRMINGHAM, ALA.—The Jaffe Iron & Metal & Co. plans to rebuild its 3-story plant building which was recently damaged by fire.

HARTFORD, CONN.—A general contract for the erection of an addition has been awarded by the J. M. Craig Brass Co.

PUTNAM, CONN.—The Marcy Tool Works, Inc., has been incorporated with $100,000 capital by A. W. Marcy. M. Marcy and H. Levine.

WASHINGTON—The American Pli-Nipper Co. has been incorporated with $500,000 capital stock to manufacture nippers, etc., by Henry G. Wernimont and others.

JACKSONVILLE, FLA.—The Rainbow Sprinkler Co., sprinklers, has been incorporated with $25,000 capital stock, by R. O. Foerster, J. E. DeBelle and others.

SARASOTA, FLA.—The Navajo Sanatorium Co. has been organized by Dr. Nabona, and will erect a plant building, 50 x 60 feet, which will be equipped for the manufacture of surgical instruments.

TAVARES, FLA.—W. A. Marsh, of this city, is making arrangements for the establishment of a plant for the manufacture of battery temperature controllers, etc.

SAVANNAH, GA.—The Savannah Electric & Power Co., has been incorporated with $4,800,000 capital stock.

CHICAGO—The Briskin Mfg. Co., 215 South Hayne avenue, plans a sheet metal factory, 2 stories, 50 x 75 feet.

CHICAGO—The Chicago Liminated Valve Co., 230 East Ohio street, has been incroporated with $60,000 capital stock, by F. Andrews, Howard E. Robinson and C. F. Roberts.

CHICAGO—The Chicago Iron Clad Timer Co., 230 East Ohio street, has been incorporated with $30,000 capital stock, by John Schultz, Alex J. Zolek and Hugh Jones.

CHICAGO—The Automatic Control & Signal Corp., 202 South Clark street, has been incorporated with $500,000 capital stock, by H. E. Bourdette, A. J. Brookins, R. L. Laird and others, to manufacture machinery, safety devices, etc.

AUBURN, KY.—The Auburn-Woodburn Electric Co. has been incorporated with $30,000 capital stock, by J. Guthrie Coke, R. L. Stevenson and others.

LOUISVILLE, KY.—The Beacon Visible Pump Co. has been incorporated with $200,000 capital stock, by J. J. Kasper, A. H. Van Dyke and others.

AUBURN, ME.—The Maine Mudguard Repairing Machine Co. has been incorporated with $200,000 capital stock, by S. R. Penney, H. C. Day and George C. Webber.

GREENVILLE, ME.—The Great Northern Paper Co. plans a 2-story machinery repair shop.

BALTIMORE—The Seaboard Iron & Steel Co. has let contracts for a number of plant buildings.

BALTIMORE—The General Steel Products Corp., 33 South Gay street, has been organized

with 500 shares of stock, by Edgar F. Kirwan, W. G. Levinson and Henry L. Fleming.

BALTIMORE—The Victor Piston Ring Co. has been incorporated with $500,000 capital stock, by Jackson Brandt American building, J. E. Butler and others.

TOWSON HEIGHTS, MD.—The Warring Ad Machine Co., has been incorporated with 100,000 shares of stock, by J. I. Haase, A. E. Haase and J. T. Dowling.

AMESBURY, MASS.—The Amesbury Specialty Co. has been incorporated to make automobile accessories with $100,000 capital, by Joseph Edgar, Verner H. Drew, Haverhill, Mass., Roy N. Hill and Orvis L. Hill, both of Somerville, Mass.

AYER, MASS.—Plans are being figured for a brick and reinforced concrete, 2-story, 75 x 125-foot plant for the Chandler Machine Co., builder of factory sewing machines.

BOSTON—The Oxford Steel Products Co. has been incorporated with $300,000 capital stock, by C. E. Dodge, M. T. Viall, Cranston, R. I., and Edwin C. Burbank, Malden, Mass.

BOSTON—The George C. Horron Co., has been incorporated with $125,000 capital stock, by George C. Horron, I. J. Horron and A. M. Horron Jr.

BOSTON—The National Aero Corp. has been incorporated to make airplane equipment with $100,000 capital, by Ralph N. Haynes, Wilfred Mulveny, Brookline, Mass., and Frank Mulveny, Fall River, Mass.

CAMBRIDGE, MASS.—A. F. Robinson, builder of boilers, has let the contract for a 1 and 2-story, 95 x 95 x 195-foot factory to cost $50,000.

HOLYOKE, MASS.—The McKinnon Vacuum Trolley Harp Co. has been incorporated to make mechanical equipment by Allen McKinnon, Henry E. McElwain and C. A. Freeman.

INDIAN ORCHARD, MASS.—The Chapman Valve Mfg. Co., plans a 1-story building for the storage of scrap metals.

WORCESTER, MASS.—The Kristek Mfg. Co. has been incorporated to make firearms, pins and appliances with $50,000 capital by Marx C. Kristek, Harry A. Katz and J. Joseph McCarthy.

ECORSE, MICH.—The Hinkley Motor Corp., 3420 West Forth street, Detroit, has awarded a contract for a factory and power house, 1-story, 250 x 340.

GULFPORT, MISS.—Richard Carter Co. plans to enlarge its plant for the manufacture of engines, etc.

CONCORD, N. H.—The Boston & Maine railroad has let the contract for the erection of a brick and concrete round house, office building and sand house to cost $200,000.

ELIZABETH, N. J.—The plant of the Warner-Quinlan Asphalt Co. recently was damaged by fire. It will be rebuilt.

FLORENCE, N. J.—A $25,000 foundry addition will be erected by the Florence Pipe Foundry & Machine Co. The building will be 1-story, 40 x 100 feet.

GLOUCESTER, N. J.—Bids have just been closed by this city on a new pumping station.

NEWARK, N. J.—A $55,000 storage house will be erected here by W. Kolba Construction Co. The building will be 4-stories, 100 x 105 feet.

NEWARK, N. J.—Mason & Urner, Inc., has been incorporated with $25,000 capital stock to make oil products, by Thomas T. Gray, Frank B. Mason, Elizabeth, N. J., and Frank A. Urner, Fanwood, N. J.

NEWARK, N. J.—The Koehler Machine & Tool Co. has been incorporated with $125,000 capital stock, by Henry Koehler, Joseph Klopak and John J. Evans.

ALBANY, N. Y.—Plans are being prepared by the Thatcher Propeller Co. for a new plant.

ALBANY, N. Y.—The Hires-Turner Co. has received a contract for a $10,000 factory and power unit, to be erected here.

BROOKLYN, N. Y.—The Hoffman Enameling Corp. has been incorporated with $25,000 capital stock, by B. C. Sprague, P. H. Hoffman and A. V. Maday, 66 Broadway.

BROOKLYN, N. Y.—The Atlas Elevator Device Corp. has been incorporated with $100,000 capital stock, by E. Weigele, W. H. Dinspel, E. R. Gippert, 165 Broadway and others.

BUFFALO—The National Windshield Co. has been incorporated with $25,000 capital stock, by C. Harris, W. B. and B. R. Frear.

NEW YORK—The Handy Machine Tool & Engineering Co. has been incorporated with $10,000 capital stock, by A. and R. Friedman, J. Koota and H. Rubin, 302 Broadway.

NEW YORK—The Loop Lock Corp. has been incorporated with $50,000 capital stock by L. Herold, T. Resnik and M. Schenkman, 56 Pine street, to manufacture locks, etc.

NEW YORK—The Reven Screen Corp. has been incorporated with $10,000 capital stock by F. A. and A. L. Raven, E. O. Friedman and A. P. Hawkins, 165 Broadway.

NEW YORK—Bear Tractors, Inc., motors and engines, has been incorporated with $500,000 capital stock, by W. J. Greacen, P. Sawyer and E. Conway, 233 Broadway.

ROCHESTER, N. Y.—The Clerglas Chemical Corp. has been incorporated with $50,000 capital stock, by J. E. Britton, G. H. Gunn and R. J. Fisher.

CHARLOTTE, N. C.—The Twin Pin Clothesline Co. has been organized by D. S. and W. J. Boyles, to manufacture wire clothes pins.

CLEVELAND—The Tell-Stop Appliance Co. has been incorporated with $500 capital stock, by E. C. Daoust, T. M. Dye, K. T. Siddall, Q. H. Findlay and N. J. Horsburgh.

CLEVELAND—The Super-Built Construction Co. has been incorporated with $10,000 capital stock, by A. G. Simon, A. E. French, A. G. Gaspard, Ralph McNalley and Walter J. Wefel.

CLEVELAND—The Cleveland Fire Door Co. has been incorporated with $20,000 capital stock, by John H. Schultz, Edward C. Daoust, and others.

CLEVELAND—The Harvard Engineering Development Co. has been incorporated with $25,000 stock, by H. P. Hartrath, Joseph S. Krajewski and others.

COLUMBUS, O.—The Columbus Repeating Pistol Co. has been incorporated with $10,000 capital stock, by A. L. Jones, M. Martin, J. E. Toole, Charles Haas and Arthur Kindler.

MASSILLON, O.—The Ladel Co. has awarded a contract for a factory building, 90 x 300 feet.

ALLENTOWN, PA.—The General Testing Laboratory has been incorporated with $10,000 capital stock to examine, test and analyze materials, by Samuel I. Henry, 102 North Tenth street, Henry R. Laub and Charles O. Henry.

CHESTER, PA.—Plans are being prepared for a power house for the St. James Mercy hospital. F. Ferdinand Durang is architect in charge.

LANGSFORD, PA.—A coal breaker costing about $1,000,000 including equipment, will be erected by the Lehigh Coal & Navigation Co., to replace the structure recently damaged by fire.

PHILADELPHIA—Davis Bros., Inc., have been incorporated with $10,000 capital stock to manufacture and deal in railroad spikes, etc., by Edward L. Davis, 107 West Willow Grove avenue, E. P. Davis, 8204 Seminole avenue, and L. D. McCall, Merion, Pa.

PHILADELPHIA—The Regal Spring Bed Co. has been incorporated with $30,000 capital stock to manufacture and deal in beds, springs, etc., by Abe Charnofsky, 5742 Pine street, Benjamin Dickman, 276 South Felton street, and Joseph Rash, 5742 Pine street.

PHILADELPHIA—E. P. Alexander & Son, Inc., has been incorporated with $50,000 capital stock to manufacture and deal in leather belting, etc., by V. H. Alexander, 2417 Race street, 409 North Thirty-sixth street, and Julian Alexander 3417 Race street, and H. G. Hill, 3509 Baring street.

PITTSBURGH—The Oberndorf Mfg. Co., 7509 Thomas boulevard, plumbing supplies, etc., plans a factory building, 1-story, 160 x 200 feet, to cost about $90,000.

PITTSBURGH—The DeVassie, Beedle & Duffey Automotive Grinding Co. has been incorporated with $10,000 capital stock, by H. M. DeVassie, 108 Schley avenue, Ingram, Pa., William B. Duffey, 923 Greenfield avenue, and E. T. Beedle, 19 East College street, Cannonsburg, Pa.

PROVIDENCE, R. I.—The New England Refining Co., Inc., has been incorporated with $30,000 capital stock, by William H. Butcher,

Additional Power Projects Planned

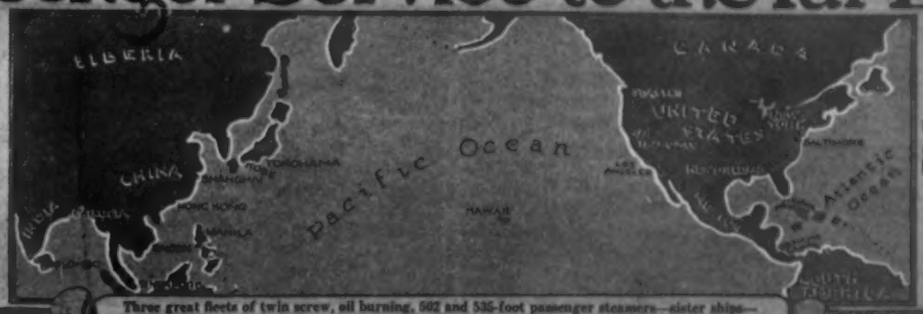
DURING the week ended July 23, three additional applications for permits or licenses under the federal water power act were filed with the Federal Power commission, Washington. This brings the total applications received to date to 236. The new applications follow:

The Portland Railway Light & Power Co., Portland, Oreg., requests a preliminary permit for a proposed future addition to its Oak Grove project on Oak Grove creek, near the mouth of Clackamas river, in Clackamas county, Oregon. This development contemplates the construction of a low diversion dam in the Clackamas river and a tunnel or canal and tunnel 4 miles long connecting with the Oak creek conduit. At a later date the low diversion dam will be replaced by a storage dam 100 to 150 feet high. No. 234.

The Haynes-Stellite Co., 30 East Forty-second street, New York, has requested a license for a project located on Big creek, in Lemhi county, Idaho. The project includes a diversion dam, a 400 yard conduit and a power house developing 270 horsepower. The power will be used for mining and milling purposes. No. 235.

The Blue Mountain Irrigation Co., Monticello, Utah, requests a license for its constructed plant, consisting of a small diversion dam in Pole canyon, San Juan county, Utah, and a 5-mile pipe line to a power house containing a 30-kilowatt generator. The power is used for general purposes in the town of Monticello. No. 236.

Passenger Service to the Far East



Three great fleets of twin screw, oil burning, 502 and 535-foot passenger steamers—sister ships—under the American flag, give a complete as well as fast, luxurious service to the traveler from the United States on the West Coast to Honolulu, Manila, Japan, China and to Calcutta and Ceylon in the Far East and from the Atlantic to the Pacific Coast and Honolulu via Havana and Panama Canal.

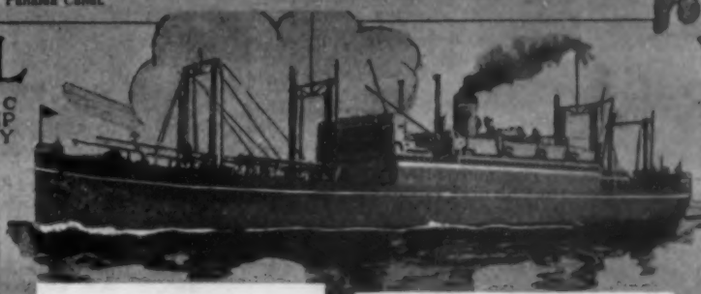
ADMIRAL LINE
PACIFIC STEAMSHIP COMPANY

THE SHORT ROUTE BETWEEN SEATTLE, YOKOHAMA, KOBE, SHANGHAI, HONGKONG AND MANILA.

The U. S. Shipping Board vessels embody the latest developments in marine construction for safety, comfort and luxuriousness.

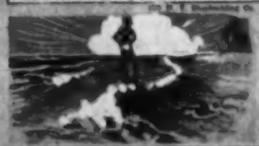
All outside staterooms, ventilating system for cooling the air on vessel and private baths. Every form of entertainment. Cuisine is all that the most fastidious and critical could desire.

For the veteran tourist, no more superb conditions for sea travel could be imagined.



SAILING DATES
SDver State - - Sept. 17
S.S. Bay State sails from New York City early August for Seattle, via Havana and Panama Canal.
HUGH GALLAGHER
Gen. Eastern Agent..17 State St.
New York City.
PACIFIC STEAMSHIP COMPANY
Seattle, Washington
or any Tourist Agency

Sheltered verandas opening off, a popular lounging place



Two-bed stateroom with private bath

MATSON LINE

A DELIGHTFUL, interesting vacation cruise from the Atlantic to the Pacific without change of steamer. An ever-changing and unforgettable panorama of quaint foreign scenes in semi-tropic seas, with cool and luxurious conditions that are conducive to real rest and recuperation. Abundant time for shore visits. Outside staterooms only, all with beds (not berths), electric fans and ventilating system, private bathrooms with showers, etc. All amusements for young and old.

BALTIMORE-HAVANA-PANAMA-SAN FRANCISCO-HONOLULU
SAILING DATES
Hawkeye State - Sept. 3
Weekly service to and from San Francisco and Honolulu
MATSON NAVIGATION COMPANY
26 S. Gay St. Baltimore, Md.
120 Market St. San Francisco
or any Tourist Agency

The Palm Garden Tea Room is a distinctive feature

Dining Saloon on a Matson liner

PACIFIC MAIL STEAMSHIP CO.
"THE SUNSHINE BELT TO THE ORIENT"

1. TRANS-PACIFIC LINE—San Francisco to Japan, Shanghai, Hongkong and Manila.
2. MANILA-EAST INDIA LINE—San Francisco to Honolulu, Manila, Saigon, Singapore, Colombo and Calcutta.

A cruise under the American flag on one of the oil burning 17½-knot U. S. Shipping Board vessels, so luxurious in every appointment, with outside staterooms, beds (not berths), electric fans and cooling ventilating system, offers tourists the very finest service on Pacific waters.

Spacious decks with all amusements, beautifully furnished lounge, social and smoking rooms add greatly to the comfort and well being of the passengers.

A Chinese dead merchant

An East Indian water charmer

Elephants at work hauling Siberian Softwoods

A sampan out in the Philippines

SAILING DATES

TRANS-PACIFIC LINE		MANILA-EAST INDIA LINE	
Hoosier State	Aug. 30	Wolverine State	Sept. 14
Golden State	Aug. 4	Creole State	Aug. 13

PACIFIC MAIL S. S. CO.
19 Hanover Square, New York City
621 Market Street, San Francisco
or any Tourist Agency

U. S. SHIPPING BOARD
WASHINGTON, D. C.

West Barrington, R. I., Lawrence J. Golden, Jersey City, N. J., and E. C. Rohman, Queens, N. Y.

WOONSOCKET, R. I.—The Shambow Shuttle Co. has let the contract for a 3-story, 80 x 150-foot mill to cost $65,000.

ANDERSON, S. C.—C. Francis Masters is reported planning to establish a welding shop here.

LAMAR, S. C.—The Lamar Power & Light Co. has been incorporated with $31,200 capital stock, by E. H. Segars, L. C. Huff and R. P. Berry.

BOLIVAR, TENN.—The Prewitt Shock Absorber Co. has been incorporated with $25,000 capital stock, by M. L. Prewitt, W. S. Follis and A. C. Osborne.

DAYTON, TENN.—The Astor Collieries has been organized with $1,500,000 capital stock to develop 6000 acres of iron ore, by J. A. Squiers 27 East Sixty-seventh street, New York and others.

MEMPHIS, TENN.—The Richerger Light & Specialty Co., 126 South Second street, is being organized to manufacture kerosene burners, etc.

BUCHANAN, VA.—The Fitch Vending Machine Co. has been incorporated with $15,000 capital stock, by J. F. Fitch, A. B. Land and O. E. Obenshain. The company will lease a plant and is reported in the market for some equipment.

RICHMOND, VA.—The Wooten Automatic Machine Co. recently was incorporated by John J. Patterson, M. F. Wooten and W. F. Reed.

RICHMOND, VA.—The American Locomotive Co. will erect a forging shop, 1-story, 85 x 162 feet.

RICHMOND, VA.—The Halifax Power Co. has been incorporated with $1,000,000 capital stock, by Ira Vaughn, J. F. Penrose and others.

RICHMOND, VA.—The Richmond Beverage Machine Corp., 401 Times-Dispatch building, has been incorporated with $100,000 capital stock by John J. Patterson, W. F. Reed and M. F. Wooten.

RICHMOND, VA.—The James Robertson Mfg. Co., 106 Hopkins place, Baltimore, has let the general contract to Davis Bros., this city, for a 2-story warehouse, 60 x 80 feet, costing $25,000, to be built at Maine and Vine streets, Richmond.

BUCHANNON, W. VA.—The Buchannon Light & Water Co. has let a contract for a power plant.

CHARLESTON, W. VA.—The Acme Electric Co. has been incorporated with $25,000 capital stock, by J. B. Ray, W. D. Payne and others.

CHARLESTON, W. VA.—The Century Mfg. Corp. has been incorporated at $250,000 by L. A. Tinder, E. A. Reid, William Lohmeyer, John Laing, and J. B. Madison.

HUNTINGTON, W. VA.—The West Virginia Foundry & Stove Works plans a foundry building, 50 x 120 feet and a warehouse, 30 x 130 feet.

HUNTINGTON, W. VA.—Two new buildings are being constructed by the West Virginia Foundry & Stove Co. costing $25,000. The foundry proper will be 50 x 120 feet and the warehouse will be 30 x 130 feet. The new buildings will enable the company to double their output. The present buildings will be dismantled and the equipment moved to the new buildings. It is expected to have the new plant ready for occupancy January 1.

MORGANTOWN, W. VA.—Development and operation of coal lands is the purpose of the Burdett-Reynolds Co., Inc., recently incorporated with $25,000 capital stock. The incorporators include J. J. Reynolds, J. L. Maust, Nat C. Burdett, A. M. Foose and Robert E. Guy.

PARKERSBURG, W. VA.—A large addition is being built to the plant of the Kootz & Stroehmann Machine Co. There are two new buildings, one 40 x 70 feet and the other 40 x 50 feet.

WHEELING, W. VA.—Work is nearing completion on an addition to the plant of the Moss Iron Works.

WHEELING, W. VA.—It is expected work will be completed soon on the erection of a power plant for the Whitaker-Glessner Co.

WHEELING W. VA.—The Ralph E. Garrity Co., with $5000 authorized capitalization, has been incorporated to deal in machinery. The incorporators are R. E. Garrity, A. O. Garrity, M. S. Wasserman, and F. K. Hutle, all of Pittsburgh, J. E. Rodge and W. H. Gold of Wheeling.

BELOIT, WIS.—W. R. Cook and E. M. Gardiner have formed the Cook-Gardiner Sanitary Rake Co. to manufacture a line of garden tools and lawn fixtures. A two-story factory, L-shaped, 30 x 80 and 30 x 60 feet, at Rockton, has been taken over from the former Weber Fanning Mill Co., and equipment is now being installed.

DENMARK, WIS.—The Dufeck Mfg. Co., capital stock $30,000, has been organized by Martin, Anton and Samuel Dufeck to build and operate a general woodworking plant.

EDGERTON, WIS.—The Highway Trailer Co. plans a factory building, 1-story, 180 x 900 feet.

GREEN BAY, WIS.—Articles of incorporation have been filed by the Wisconsin Battery & Ignition Co., organized by Ernest J. and Anton J. Balze with $25,000 capital to manufacture and repair storage batteries and automotive electrical equipment.

MARSHFIELD, WIS.—A new factory for the manufacture of storage batteries is being established here by the Stewart-Galvin Co., a new $50,000 corporation which is a consolidation of the Galvin and Stewart Battery companies. A plant has been leased and is new being equipped.

MILWAUKEE—Marquette university is having plans drawn by E. Brielumeir & Sons Co., 432 Broadway, for a power heating plant.

MILWAUKEE—The Peerless Electric Co., 2028 Fond du Lac avenue, has engaged Architects Bruecker & Tharinger to design a new shop and warehouse, 47 x 120 feet.

MILWAUKEE—Alterations in the foundry of the Filer & Stowell Co., manufacturer of sawmill and woodworking machinery, have been started. The work will cost about $18,000.

MILWAUKEE—The Jessen Auto Equipment Co., 417 Jackson street, will build a new factory and workshop, including a storage battery maintenance station, 63 x 70 feet, at a cost of about $20,000, including equipment.

MILWAUKEE—A new foundry and machine shop to cost about $35,000 will be built by the Sommers & Son Co., 3022 Gaena street, on a new site at Thirty-first and Burleigh streets. The company manufactures special machinery for milk condensories. The new building will be 40 x 120 feet. Byrne Bros. have the general contract.

Business in Canada

SELKIRK, MAN.—General Utilities, Ltd., has been organized by J. Lannen, W. H. Gibbs and others, and will erect a plant for the manufacture of automobile chains, etc.

WINNIPEG, MAN.—The Manitoba Gypsum Co., Ltd., 504 Trust & Loan building, is having plans prepared for extensions and improvements to its plant and some new equipment will be installed.

BARRIE, ONT.—The Oro Cement Products, Ltd., recently incorporated with $40,000 capital stock has secured a building here and will equip it for the manufacture of cement products, brick, etc.

CHATAM, ONT.—The Weaver-Canadian Co., Ltd., has been incorporated to manufacture tools, machinery, etc., with $50,000 capital stock, by John G. Stewart, E. F. Brady and others.

HAMILTON, ONT.—Clemson Bros., Inc., have been incorporated to manufacture saws, etc., with $50,000 capital stock, by Frederick J. Macdonell and others.

HAMILTON, ONT.—The National Slag Production Co. has secured property here and will establish a plant. Slag from the plant of the Steel Co. of Canada, Hamilton, will be utilized. The company is capitalized at $300,000 and is headed by Edwin J. Robertson.

MILVERTON, ONT.—The Great West Farm Machines, Ltd., has been incorporated to manufacture farm implements, machinery, tools, etc., with $300,000 capital by Henry C. Mohr, John Boshart, Enos Nafziger and others.

PRESTON, ONT.—The H. W. Steel Shank & Specialty Co., Ltd., has been incorporated to manufacture steel shanks and specialties, with $50,000 capital stock, by S. H. Parker, Henry W. Steel and Frederick P. Steel.

SAULT STE MARIE, ONT.—The Rapid Electric Co., Ltd., has been incorporated to manufacture electric machinery, etc., with $40,000 capital stock, by Charles T. Toombs, George L. Wilson and Arthur P. Crawford.

TORONTO, ONT.—Stanley J. Brown, Ltd., has been incorporated to manufacture electrical supplies with $100,000 capital stock, by K. T. Mackenzie, M. Gordon and George S. Sanderson.

TORONTO, ONT.—The city council plans harbor drainage work to cost $691,000, which includes construction of a pump house, pumping equipment, etc. T. L. Church is chairman.

TORONTO, ONT.—Alfred Herbert, Ltd., a corporation created under the laws of the United Kingdom has been granted license to carry on business as manufacturers and dealers in machinery, tools, boilers, iron, steel and metal products, with $100,000 capital stock. James C. Blair, Toronto, has been appointed representative.

WINDSOR, ONT.—Miller-York, Inc., has been incorporated with $50,000 capital stock to engage in electrical manufacturing, by E. A. Cleary and others.

LEVIS, QUE.—The Fletcher Ship Repairing Co., Ltd., has been incorporated with $500,000 capital stock, by William J. Bishop, William T. Fletcher and others.

MONTREAL, QUE.—The Stokes Carburetor Co., Ltd., has been incorporated with $100,000 capital stock, by William R. Stokes, K. Stokes, and M. Lappointe.

MONTREAL, QUE.—The Dominion Oxygen Co., Ltd., 120 Elm street, Toronto, Ont., has awarded the general contract to the James Shearer Co., Ltd., Toronto, for an oxygen plant here to cost $250,000.

The Machinist Says

"There are times when we seem to be all thumbs. Constantly dropping things on the floor. But it never matters when you're working on a KREODONE WOOD BLOCK FLOOR . . .

"*. . . . you can drop the most delicately machined part on a* KREODONE *floor without damaging it!*

"And, man, that means saving money. Because you don't have to make a part over again. This is only one of the many good things one can say about KREODONE, but it's a big one."

. . .

RIGHT! But there's one fundamentally big point that can never be omitted*— KREODONE'S *high quality timber is treated with pure, full-bodied creosote oil (free from adulterants and foreign substances) and this combination gives the best, most durable and satisfactory floor in the world!

REPUBLIC CREOSOTING COMPANY

Original Makers of Wood Block Floors

Indianapolis, Ind.

KREODONE WOOD BLOCK FLOORS

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCHES

1015 Chamber of Commerce Bldg., Chicago
Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
516 Beacon Bldg., Boston
Berkley Ward, Norfolk

222 Society for Savings Bldg., Cleveland
St. Louis Park, Minneapolis
317 Hosmer Street, Cincinnati
Angust Court Co., Agents
413 Chestnut Building, St. Louis

Builders Specialty Co., Agents
[illegible] Real Estate Trust Bldg., Philadelphia
[illegible] Central Bldg., Atlanta
Masonic Temple, Mobile
211 Hammond Bldg., Detroit

Iron and Steel Prices

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal.	$75.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	$8.00 to 70.00
Spiegel, 18 to 22 per cent furnace spot	27.00 to 30.00
Ferrosilicon, 50 per cent, contract delivered	65.00 to 80.00
Ferrotungsten, standard, per pound contained	45.00c to 50.00c
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, per pound contained, maker's plant	12.00c to 14.50c
Imported ferrochrome, 6 to 8 per cent carbon	14.00c to 15.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$5.00 to 6.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Cast Iron Water Pipe

Without War Freight Tax
Class B Pipe

Four-inch, Chicago	49.10 to 54.10
Six-inch and over, Chicago	46.10 to 51.10
Four-inch, New York	53.30 to 55.30
Six-inch and over, New York	48.30 to 50.30
Four-inch, Birmingham	45.00 to 50.00
Six-inch and over, Birmingham	40.00 to 45.00
Three-inch, Birmingham	55.00 to 60.00

Class A pipe is $3 higher than Class B.
Standard fittings, Birmingham, base..$100.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Rivets

Structural rivets	2.40c to 2.65c
Boiler rivets, Pittsburgh	2.50c to 2.75c
Rivets ⅞-in. and smaller, Pittsburgh	70-10 to 65-10-10 & 5 off

Nuts and Bolts

NUTS
(Up to 1⅛ and 1⅛ inches inclusive)

Hot pressed, square blank	$4.60 off
Hot pressed, square tapped	4.25 off
Hot pressed, hexagon blank	4.60 off
Hot pressed, hexagon tapped	4.25 off
Cold pressed, square tapped	4.25 off
Cold pressed, square blank	4.60 off
Cold pressed, hexagon tapped	4.25 off
Cold pressed, hexagon blank	4.60 off
Cold pressed semifinished hexagon nuts ⅜ in. and larger	70-10-10 off
Cold pressed semifinished hexagon nuts 9/16 in. and smaller	80-10-10 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(⅜ x 6 inches, smaller and shorter)

Rolled thread	65-10 off
Cut thread	60-10 off
Larger and longer	60-10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	70-7½ off
Cut thread 6	65-10 off
Larger and longer	65-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	60-5 off
Larger and longer	60 off
Lag screws	70 off
Plow bolts Nos. 1, 2 and 3 heads	60-10 off

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, nominal.
Indian 48 to 50 per cent c.i.f. Atlantic ports, 22½ to 24 cents per unit, nominal.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton..... $17.00

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$4.85
Old bed concentrates, 63 per cent	5.75
Harmony, cobbed, 63 per cent	5.75
New bed, low phos., 65 per cent	8.50
Lump ore for fix	6.00

Warehouse Prices

STEEL BARS

Boston	2.98c
Buffalo	2.80c
Chicago	2.93c
Cincinnati	3.225c
Cleveland	2.64c
Detroit	2.83c
New York	2.78c
Philadelphia	2.75c
San Francisco	4.15c
Seattle	4.15c
St. Louis	3.025c
St. Paul	3.21c
Los Angeles	2.75c

IRON BARS

Boston	2.98c
Buffalo	2.80c
Chicago	2.93c
Cincinnati	3.15c
Detroit	2.83c
New York	2.78c
Philadelphia	2.65c
St. Louis	3.025c

SHAPES

Boston	2.98c
Buffalo	2.90c
Chicago	3.03c
Cincinnati	3.25c
Cleveland	2.74c
Detroit	2.93c
New York	2.88c
Philadelphia	2.85c
San Francisco	4.25c
Seattle	4.15c
St. Louis	3.125c
St. Paul	3.31c
Los Angeles	2.85c

PLATES

Boston	3.08c
Buffalo	2.90c
Chicago	3.03c
Cincinnati	3.25c
Cleveland	2.74c
Detroit	2.93c
New York	2.88c
Philadelphia	2.85c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.125c
St. Paul	3.31c
Los Angeles	4.25c

NO. 10 BLUE ANNEALED SHEETS

Boston	3.83c
Buffalo	3.55c
Chicago	3.68c
Cincinnati	3.90c
Cleveland	3.25c to 3.50c
Detroit	3.48c
New York	3.53c
Philadelphia	3.50c
San Francisco	5.50c
Seattle	5.60c
St. Louis	3.77½c
St. Paul	3.96c
Los Angeles	5.50c

NO. 28 BLACK SHEETS

Boston	5.00c
Buffalo	4.55c
Chicago	4.90c
Cincinnati	3.15c
Cleveland	4.00c to 4.50c
Detroit	4.58c
New York	4.25c
Philadelphia	4.25c
San Francisco	6.50c
Seattle	6.45c
St. Louis	4.995c
St. Paul	5.18c
Los Angeles	6.50c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	5.55c
Chicago	5.90c
Cincinnati	4.50c
Cleveland	5.00c to 5.50c
Detroit	5.58c
New York	5.25c
Philadelphia	5.25c
San Francisco	7.50c
Seattle	7.45c
St. Louis	5.995c
Los Angeles	7.50c

BANDS

Boston	3.63c
Buffalo	3.50c
Chicago	3.63c
Cincinnati	3.85c
Detroit	3.48c
New York	3.43c
Philadelphia	3.40c
San Francisco	4.85c
Seattle	4.85c
Los Angeles	4.00c

HOOPS

Boston	4.33c
Buffalo	3.50c
Detroit	3.48c
New York	3.88c
Philadelphia	3.65c

COLD ROLLED SHAFTING

Boston	4.65c
Buffalo	4.20c
Chicago	4.35c to 4.85c
Cincinnati	4.40c
Detroit	4.30c
New York	4.23c
New York (flats, squares and hexagons)	4.73c
Philadelphia	4.40c
San Francisco	5.85c
Seattle	5.75c
Los Angeles	5.85c

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60

Buffalo to:

Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46

Virginia furnaces to:

Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16

Birmingham, Ala., to:

Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.265
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725

Chicago to:

Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725

Ironton and Jackson, O., to:

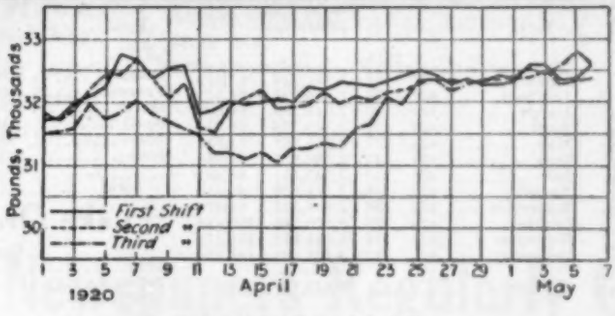
Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	$0.38
Philadelphia	0.35
Boston	0.415
Buffalo	0.295
Baltimore	0.335
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665

MODERN METHODS AND PRACTICES



Operating data Semet-Solvay Plant.
Average number of pounds of coal charged per oven on the different shifts.

Whether the plant is old or new its success depends upon the uniformity of operation. Semet-Solvay design and construction is such that perfect uniformity is assured.

With the Semet-Solvay By-Product Coke Oven the daily average charge per oven is uniform and there is but little variation in the weight of coal charged in the various ovens. The regularity maintained in this operation is shown by the chart above, which gives the average daily weight of coal charged per oven on the different shifts.

Correspondence is invited

Address Plant Development Department

SEMET-SOLVAY COMPANY

Syracuse, New York

1892—Pioneer in the development of the By-Product Coke Oven—1921

SEMET-SOLVAY BY-PRODUCT COKE OVENS

Iron and Steel Production

Compiled By THE IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	Output Total	Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,680,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,393	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,516	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,780	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,065,965	35,532
Total			9,411,001	

Lake Ore Shipments

Gross Tons

1920	60,411,572
1919	48,546,651
1918	62,836,172
1917	64,437,003
1916	66,658,466
1915	47,272,751
1914	32,729,726
1913	49,947,116
1912	48,221,546
1911	32,793,130
1910	43,435,171
1909	42,586,869
1908	26,014,987
1907	42,266,668

By Months, 1921

April	176,211
May	2,594,027
June	3,600,989
Total	6,371,227

Ingots and Castings

By American Iron & Steel Institute

	Ingots	Castings	Total
1910	25,154,087	940,832	26,094,919
1911	23,029,479	646,627	23,676,106
1912	30,284,682	966,621	31,251,303
1913	30,280,130	1,020,744	31,300,874
1914	22,819,784	693,246	23,513,030
1915	31,284,212	866,824	32,151,036
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934

Monthly Ingot Output

	Gross Tons 84.21 per cent of of capacity	Indicated total
January	2,203,186	2,620,000
February	1,749,477	2,080,000
March	1,570,978	1,860,000
April	1,213,958	1,440,000
May	1,265,850	1,500,000
June	1,003,406	1,190,000
Total	9,006,855	10,690,000

WEATHER
Partly cloudy, warmer, with possibly showers Wednesday; Thursday, fair.
VOL. 60. NO. 145.
THE ERIE DISPATCH
MEMBER OF THE ASSOCIATED PRESS
ERIE, PA., WEDNESDAY
Read The Dispatch and Get the Latest News at the Earliest Hour
Iron Trade Review Points to Stabilization of Industry by Action
FIRST ORE SHIPMENT CLEARS DULUTH TUESDAY
Several Awards for Structural Products Are Items of the Week
Cleveland, O., April 13.—The Iron Trade Review tomorrow will say:
Due to the price reductions announced by the steel corporation late Tuesday and to advances adopted by the leading independents last

The Erie Dispatch is the most widely read newspaper in the Pennsylvania city, where are located many large industrial plants. It is a morning paper and has a reputation for accuracy and completeness of information.

400 Newspapers Regularly Quote

THE IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$11.00 to 12.00
Boston (dealers)	6.00 to 6.50
Buffalo	10.00 to 11.00
Chicago	10.25 to 10.75
Cincinnati	8.50 to 9.00
Cleveland	11.50 to 12.00
Detroit (dealers)	7.50 to 8.00
Eastern Pennsylvania	11.50 to 12.00
New York (dealers)	7.00 to 7.50
Pittsburgh	12.00 to 12.50
San Francisco	9.00 to 10.00
St. Louis	9.50 to 10.00
Valleys	11.50 to 12.00

BUNDLED SHEETS

Buffalo	$6.00 to 7.00
Cleveland (hydraulic)	8.00 to 9.00
Cincinnati	5.00 to 6.00
Eastern Pennsylvania	8.00 to 8.50
Pittsburgh	7.50 to 8.00
St. Louis	4.00 to 4.50

STEEL RAILS, SHORT

Birmingham	$11.50 to 12.50
Boston (dealers)	7.00 to 8.00
Chicago	11.50 to 12.00
Cincinnati	13.00 to 14.00
Cleveland	10.00 to 11.00
St. Louis	10.00 to 10.50

STOVE PLATE

Birmingham	$12.50 to 13.50
Boston	10.50 to 11.00
Buffalo	12.00 to 13.00
Chicago	13.00 to 13.50
Cincinnati	10.00 to 10.50
Cleveland	13.50 to 14.00
Detroit	10.00
Eastern Pennsylvania	12.00 to 12.50
New York	8.50 to 9.00
Pittsburgh	12.00 to 13.00
St. Louis	10.50 to 11.00

LOW PHOSPHORUS

Buffalo	$15.00 to 16.00
Cincinnati	17.00 to 18.00
Eastern Pennsylvania	16.00 to 17.00
Pitts. billet and bloom crops	15.00 to 15.50

SHOVELING STEEL

Chicago	$9.50 to 10.00
Pittsburgh	8.00 to 8.50
St. Louis	8.50 to 9.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$11.00 to 11.50
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	13.00 to 13.50
St. Louis	10.00 to 10.50

COMPRESSED SHEETS

Buffalo	$9.00 to 9.50
Chicago	7.00 to 7.50
Pittsburgh	9.00 to 9.50

FROGS, SWITCHES, GUARDS

Chicago	$10.00 to 10.50
Eastern Pennsylvania	11.00 to 11.50
St. Louis	9.00 to 9.50

BOILER PLATE, CUT

Detroit (dealers)	$6.00 to 6.50
St. Louis	6.00 to 6.50

ANGLE BARS—STEEL

Chicago	$11.00 to 11.50
St. Louis	9.00 to 9.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham, No. 1	$11.50 to 12.50
Boston (dealers)	11.00 to 12.00
Buffalo	13.00 to 14.00
Chicago, No. 1	10.50 to 11.00
Chicago No. 2	10.00 to 10.50
Cincinnati No. 1	8.50 to 9.50
Cleveland, No. 1	13.00 to 13.50
Eastern Pennsylvania, No. 1	14.00 to 15.00
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	10.00 to 11.00
Pittsburgh, No. 2	12.00 to 12.50
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	8.50 to 9.00

WROUGHT PIPE

Boston (dealers)	$6.50 to 7.00
Buffalo	9.50 to 10.50
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	8.00 to 8.50

YARD WROUGHT

Boston	$8.00 to 9.00
Eastern Pennsylvania No. 1	12.00 to 13.00

CITY WROUGHT

New York, long	$9.00 to 9.50

BUSHELING

Buffalo, No. 1	$9.00 to 10.00
Chicago, No. 1	8.50 to 9.00
Chicago, No. 2	7.50 to 8.00
Cincinnati, No. 1	8.50 to 9.50
Cleveland, No. 1	8.00 to 8.50
Cleveland, No. 2	5.50 to 6.00
Eastern Pennsylvania, No. 1	12.50 to 13.00
Pittsburgh	11.50 to 12.00
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	$5.00 to 6.00
Boston (dealers)	2.00 to 2.50
Buffalo	5.00 to 6.00
Chicago	3.00 to 4.00
Cincinnati	2.00 to 2.50
Cleveland	6.00 to 7.00
Detroit (dealers)	2.00
Eastern Pennsylvania	8.00 to 8.50
New York (dealers)	3.00 to 3.50
Pittsburgh	7.00 to 7.50
St. Louis	4.00 to 4.50
Valleys	6.50 to 7.00

CAST IRON BORINGS

Birmingham	$5.00 to 6.00
Boston (chemical)	3.50 to 4.00
Boston (dealers)	2.50 to 3.00
Buffalo	5.00 to 6.00
Chicago	4.50 to 5.00
Cincinnati	3.00 to 3.50
Cleveland	6.00 to 7.00
Detroit (dealers)	3.00
Eastern Pennsylvania	9.00 to 9.50
Eastern Pennsylvania (chem.)	10.00 to 11.00
New York (dealers' price)	4.00 to 4.50
Pittsburgh	7.00 to 7.50
St. Louis	5.50 to 6.00
Valleys	10.00 to 10.50

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$2.00 to 2.50
Cleveland	6.00 to 7.00
Eastern Pennsylvania	7.50 to 8.00

IRON AXLES

Birmingham	$19.00 to 20.00
Buffalo	26.00
Chicago	18.00 to 18.50
Cincinnati	17.00 to 17.50
Cleveland	19.50 to 20.50
Detroit	23.00 to 24.00
Eastern Pennsylvania	25.00 to 26.00
New York (dealers)	18.00 to 19.00
Pittsburgh	18.00 to 19.00
St. Louis	17.00 to 17.50

IRON RAILS

Buffalo	$21.00 to 22.00
Chicago	15.00 to 15.50
Cincinnati	13.00 to 14.00
Cleveland	12.50 to 13.00

PIPES AND FLUES

Chicago	$7.00 to 7.50
Cincinnati	5.00 to 5.50
Cleveland	7.00 to 7.50
Detroit	6.00
St. Louis	6.00 to 6.50

RAILROAD GRATE BARS

Buffalo	9.00 to 10.00
Chicago	10.75 to 11.25
Cleveland	13.50 to 14.00
Detroit	9.50 to 10.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	9.00 to 9.50
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston (dealers)	$4.50 to 5.00
Chicago, small	7.00 to 7.50
Cleveland, small	7.25 to 7.75
Cleveland, large	7.50 to 8.00
Detroit (dealers)	4.00

FORGE SCRAP

Boston	$4.50 to 5.00
Chicago	9.50 to 10.00
Eastern Pennsylvania, No. 1	10.00 to 10.50

ARCH BARS AND TRANSOMS

Chicago	$15.50 to 16.00
St. Louis	12.50 to 13.00

ANGLE BARS—IRON

Chicago	$13.50 to 14.00
St. Louis	10.50 to 11.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$3.50 to 4.00
Buffalo	8.00 to 9.00
Chicago	6.50 to 7.00
Cleveland	8.50 to 9.50
Detroit	5.50 to 6.50
Eastern Pennsylvania	9.50 to 10.00
Pittsburgh	9.50 to 10.00
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	$14.00 to 15.00
Boston (dealers)	12.00 to 13.00
Buffalo	20.00 to 21.00
Chicago	13.00 to 13.50
Cleveland	18.50 to 19.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	11.50 to 12.00
Pittsburgh	13.50 to 14.00
St. Louis	13.00 to 13.50

SHAFTING

Boston (dealers)	$12.00 to 13.00
Chicago	19.50 to 20.50
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	12.00 to 13.00
Pittsburgh	13.00 to 14.00
St. Louis	12.00 to 12.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$11.50 to 12.50
Birmingham, tram car	11.00 to 12.00
Boston (consumers)	17.50 to 18.00
Buffalo, iron	13.00 to 14.00
Chicago, iron	12.50 to 13.00
Cincinnati	11.00 to 12.00
Cleveland, iron	35.00 to 36.50
Detroit	12.00
Eastern Pennsylvania, iron	16.00 to 17.00
New York, iron	13.00 to 13.50
Pittsburgh, iron	13.00 to 13.50
Pittsburgh, steel	12.50 to 13.00
St. Louis, iron	11.00 to 11.50

NO. 1 CAST SCRAP

Birmingham cupola	$15.00 to 16.00
Boston (consumers)	16.50 to 17.00
Buffalo	15.00 to 16.00
Chicago, cupola	13.00 to 13.50
Cincinnati, No. 1, machinery, cupola (net)	12.00 to 13.00
Cleveland, cupola	17.50 to 18.00
Eastern Pennsylvania, cupola	16.50 to 17.50
New York cupola (dealers)	13.50 to 14.00
Pittsburgh, cupola	14.50 to 15.50
San Francisco	20.00 to 21.00
St. Louis, agricultural	12.00 to 12.50
St. Louis, railroad	12.00 to 12.50
Valleys	18.00 to 19.00

HEAVY CAST

Boston (consumers)	$12.00 to 13.00
Buffalo	16.00 to 16.50
Cleveland	12.00 to 12.50
New York (dealers)	13.00 to 13.50
Pittsburgh	13.50 to 14.00

MALLEABLE

Boston, railroad	$14.50 to 15.00
Buffalo	11.50 to 12.50
Chicago, railroad	13.00 to 13.50
Chicago, agricultural	13.00 to 13.50
Cincinnati, agricultural	8.50 to 9.00
Cincinnati, railroad	8.50 to 9.00
Cleveland, agricultural	10.00
Cleveland, railroad	13.00
Detroit	9.00 to 9.50
Eastern Pennsylvania, railroad	15.00 to 16.00
Pittsburgh, railroad	11.50 to 12.00
Pittsburgh, agricultural	9.00 to 10.00
St. Louis, agricultural	8.50 to 9.00
St. Louis, railroad	9.00 to 9.50

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Birmingham	$11.50 to 12.50
Boston (dealers)	8.00 to 9.00
Chicago	11.75 to 12.25
Cleveland	14.50 to 15.00
Detroit (dealers)	9.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	13.50 to 14.50
Pittsburgh district	14.50 to 15.00
St. Louis	10.00 to 10.50

LOCOMOTIVE TIRES

Chicago	$11.00 to 11.50
St. Louis	8.50 to 9.00

LOW PHOSPHORUS PUNCHINGS

Chicago	$12.50 to 13.00
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	12.50 to 13.00

IRON and STEEL SCRAP

MANGANESE STEEL SCRAP

WE ARE IN THE MARKET FOR

MANGANESE
STEEL SCRAP

MILLCO" SERVICE

THE JAMES S. MILLER CO.
McCORMICK BLDG.
CHICAGO

MANGANESE STEEL SCRAP

FERRO ALLOYS

New Trade Publications

SCOOP ATTACHMENT—Pawling & Harnischfeger Co., Milwaukee, is circulating a 4-page illustrated folder in which a scoop attachment for excavator cranes is described and illustrated. This attachment is said to be useful in road grading, tearing up of roads, shovel excavating, backfilling, material handling, pile driving, etc.

WELDING AND CUTTING—The Bastian-Blessing Co., Chicago, has published a 40-page illustrated booklet in which welding and cutting apparatus is described and illustrated. Full descriptions and specifications are given of torches, both welding and cutting, manifolds, regulators, and general welding and cutting apparatus accessories.

INSULATION—A small folder has been published by the Armstrong Cork & Insulation Co., Pittsburgh, in which the advantages of proper heating insulations are pointed out. The folder is illustrated, and the insulation material described is, according to the booklet, especially suited for use on vulcanizers, cookers and similar equipment whose insulation is frequently subjected to excessive quantities of steam or water.

AIR COMPRESSORS—The Bury Compressor Co., Erie, Pa., is circulating a 20-page illustrated booklet in which its line of air compressor is described and illustrated. These compressors are adapted for mounting a synchronous motor on the shaft between the bearings and the two main frames. These compressors are built in sizes ranging from 300 cubic feet to 10,000 cubic feet capacity. Some of the features of design as pointed out in the booklet are: Direct connected synchronous motor mounted on shaft, round sectional main bearings, sectional intercooler, same ratio of compression at all loads, no undue heat at any load and patented pyramid box plate inlet and discharge valves.

MACHINE ATTACHMENTS—The Pearson-Scott Co., Indianapolis, has published a 16-page illustrated booklet in which an automatic attachment for hand screw machines and turret lathes is described and illustrated. According to the booklet this attachment can be used with a hand screw machine or turret lathe and make it work full automatic on either bar or chuck work. The attachment is described in detail.

HEATER—The American Blower Co., Detroit, has published a 4-page illustrated folder in which a direct-fired unit heater is described and illustrated. This heater consists of a cast iron heat generator installed in a steel insulated casing. An electric motor-driven fan forces air over the warmed surfaces of the heat generator and this heated air is then discharged into the room, or through galvanized ducts to various parts of the building. The heater is described in detail.

HOIST—The Sullivan Machinery Co., Chicago, has published a 4-page illustrated leaflet in which a small air hoist is described and illustrated. According to the leaflet, this hoist may be mounted on a cross bar or column in a shaft, winze or raise, for handling drills, steel or timber; it may be bolted to a timber or girder or to a wall or floor for pulling cars, piling lumber and various odd jobs of hauling and hoisting. It has a capacity of 1500 pounds dead load lifted vertically at 100 feet per minute under 80 pound air pressure. Other details are given.

PRESSED STEEL—An 8-page illustrated booklet has been published by the Sharon Pressed Steel Co., Sharon, Pa., in which, the company's plant policy and facilities as well as products are described and illustrated. The illustrations include those of a number of machines operated at the company's works. This plant's equipment ranges from large 4000-ton presses to small lathes and drill presses, each machine said to be selected because of its fitness for its particular line of work. Modern cranes and hoists aid in production by the handling of raw materials, etc., thus lowering the costs of the finished products.

PUMPS—Dry vacuum pumps, single cylinder, steam and belt driven are described and illustrated in a 12-page illustrated booklet recently published by the Sullivan Machinery Co., Chicago. These pumps are built in capacities ranging from 300 to 1600 cubic feet displacement per minute. According to the booklet these pumps are of the center crank pattern with main bearings, crankshaft and fly wheels at one end of the machine, and the vacuum, or the steam and vacuum cylinders at the rear end. The frame is of rugged construction. The crankshaft is supported in removable, die-cast babbitt bearings which are carried by seats in the frame. Other parts of the machine are described and specifications are given.

Industrial Business Changes Recently Announced

E A. KEITHLEY, Rialto building, San Francisco, representing the Central Foundry Co., the Essex Foundry Co., the Milwaukee Brass Mfg. Co., H. O. Canfield Co., G. M. Davis Regulator Co. and the Pittsburgh Valve, Foundry & Construction Co., has opened offices in the Alaska building, Seattle. E. L. Keithley has been placed in charge of the office.

* * *

John L. Key, Call building, San Francisco, has been appointed Pacific Coast representative for the Forges de La Providence, Marchienne-au-pont, Belgium, and will handle the full line of steel products manufactured by that company.

* * *

The Pharo Mfg. Co., maker of governors, has moved from Detroit to Bethlehem, Pa.

* * *

Atkinson & Utech, Inc., 111 Broadway, New York, and Theodore L. Dodd & Co., 80 East Jackson boulevard, Chicago, have been appointed selling agents for the Commercial Drop Forge Co., Warren, Pa.

* * *

The Daynite Furniture Mfg. Co., manufacturer of furniture and store fixtures, has moved its office from Cape Girardeau, Mo., to room 213 Choteau Trust building, St. Louis.

* * *

The Hydraulic Hoist Mfg. Co., Detroit, has moved to larger quarters at 5730 Michigan avenue. It formerly was located at 954 East Milwaukee avenue, that city.

* * *

Branch offices have been opened at 53 State street, Boston, room 613, by the C. H. Wheeler Co., Philadelphia, manufacturer of condensers, pumps, etc.

* * *

The Atlantic Welding Works has changed its name to the Atlantic Welded Products Co. and moved its offices to 1725-27 North Howard street, Philadelphia.

* * *

Branch offices have been opened in the E. C. Smith building in Seattle, by the Andrew Carrigan Co., Rialto building, San Francisco. N. C. Vestal, formerly of the Northwest Trading Co., has been placed in charge of the new offices.

* * *

Offices have been opened in the Riggs building, Washington, by the Miller Train Control Corp., Danville, Ill.

* * *

Offices of the W. S. Wetenhall Co., San Francisco, recently were moved from 440 Irwin street to 701 Atlas building.

* * *

John A. Conboy Co., contractors, railroad, mine and industrial machinery and supplies, has opened offices in Philadelphia. The company was recently organized.